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GENERAL VIEW

OF THE

AGRICULTURE

OF THE

COUNTY OF GLOUCESTER.

DRAWN UP FOR THE CONSIDERATION OF

Gt. Brit.

THE BOARD OF AGRICULTURE

AND INTERNAL IMPROVEMENT,

BY

THOMAS RUDGE, B.D.

LONDON:

PRINTED FOR RICHARD PHILLIPS,
NO. 6, BRIDGE-STREET;
SOLD BY WILKIE AND ROBINSON, PATERNOSTER-ROW; J. ASPERNE, CORNHILL, LONDON; HOUGH AND SON, AND WASHBOURN, GLOUCESTER; RUFF, AND JONES, CHELTENHAM; REDDELL, TEWKESBURY; JENNER, STROUD; STEVENS AND WATKINS, CIRENCESTER; ARCH. CONSTABLE AND CO. EDINBURGH; AND J. ARCHER, DUBLIN.

Price 9s. in Boards.

1807.

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HD1925
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Printed by D. Walker, Gloucester.

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It is proper at the same time to add, that the Board does not consider itself responsible for every statement contained in the Reports thus reprinted, and that it will thankfully acknowledge any additional information which may still be communicated.

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CONTENTS.

Page

CHAPTER I.—GEOGRAPHICAL STATE AND CIRCUMSTANCES.

SECT. 1.—Situation and Extent - - - 1
2.—Divisions - - - - - - 2
3.—Climate - - - - - - 13
4.—Soil and Surface - - - - 15
5.—Minerals - - - - - - 20
6.—Water - - - - - - 24

CHAP. II.—STATE OF PROPERTY.

SECT. 1.—Estates, and their Management - 34
2.—Tenures - - - - - - 35

CHAP. III.—BUILDINGS.

SECT. 1.—Houses of Proprietors - - - 38
2.—Farm Houses and Offices; and Repairs 43
3.—Cottages - - - - - - 47

CHAP. IV.—MODE OF OCCUPATION.

SECT. 1.—Size of Farms.—Character of the Farmers - - - - - 52
2.—Rent—in Money—in Kind—in Personal Services - - - - 58
3.—Tythes - - - - - - 59
4.—Poor Rates - - - - - 64
5.—Leases - - - - - - 66
6.—Expence and Profit - - - - 67

Page
CHAP. V.—IMPLEMENTS, - - - - 81

CHAP. VI.—INCLOSING—FENCES—GATES, 89

CHAP. VII.—ARABLE LAND.

SECT. 1.—Tillage - - - - - - 101
2.—Fallowing - - - - - - 104
3.—Rotation of Crops - - - - 107
4.—Crops commonly cultivated; their Seed, Culture, Produce, &c. - - - 109
5.—Crops not commonly cultivated - - 151

CHAP. VIII.—GRASS.

SECT. 1.—Natural Meadows and Pastures - 165
2.—Artificial Grasses - - - - 174
3.—Hay Harvest - - - - - 182
4.—Feeding - - - - - - 187

CHAP. IX.—GARDENS AND ORCHARDS, - - - 196, 202

CHAP. X.—WOODS AND PLANTATIONS, 239

CHAP. XI.—WASTES, - - - - - 250

CHAP. XII.—IMPROVEMENTS.

SECT. 1.—Draining - - - - - - 258
2.—Paring and Burning - - - 264
3.—Manuring - - - - - - 267
4.—Weeding - - - - - - 273
5.—Watering - - - - - - 275

Page

CHAP. XIII.—LIVE STOCK.

SECT. 1.—Cattle - - - - - - 282
2.—Sheep - - - - - - 305
3.—Horses, and their Use in Husbandry, compared to Oxen - - - 318
4.—Hogs - - - - - - - 322
5.—Rabbits - - - - - - 322
6.—Poultry - - - - - - 323
7.—Pigeons - - - - - - 325
8.—Bees - - - - - - - 326

CHAP. XIV.—RURAL ECONOMY.

SECT. 1.—Labour—Servants—Labourers—Hours of Labour - - - - - - 328
2.—Provisions - - - - - - 329
3.—Fuel - - - - - - 330

CHAP. XV.—POLITICAL ECONOMY, AS CONNECTED WITH OR AFFECTING AGRICULTURE.

SECT. 1.—Roads - - - - - - 333
2.—Canals - - - - - - 336
3. 4.—Fairs and Weekly Markets - - 338
5. 6.—Manufactures and Commerce - 341
7.—Poor - - - - - - 343
8.—Population - - - - - - 351

CHAP. XVI.—OBSTACLES TO IMPROVEMENT, INCLUDING GENERAL OBSERVATIONS ON AGRICULTURAL LEGISLATION AND POLICE, 363

Page

CHAP. XVII.—MISCELLANEOUS OBSERVATIONS.

SECT. 1.—Agricultural Societies - - - - 368
2.—Weights and Measures - - - - 368
3.—Supply of London - - - - - 370
4.—Experimental Farm - - - - - 370

CONCLUSION.—MEANS OF IMPROVEMENT, AND MEASURES CALCULATED FOR THAT PURPOSE, - - - - - - - 371

APPENDIX, - - - - - - - 379

ERRATA AND ADDITIONS.

Page.	Line.	
38	32	Highmeadow-house, has lately been taken down.
39	10	Walter Long, Esq. died since this list was printed.
40	13	The heir to the Eyford estate is a minor, and under the tuition of his uncle, Rev. Mr. Dolphin, who resides at Lower Slaughter.
41	4	Edwyn Bayntun Sandys, Esq. a relation of Sam. Sandys, Esq. resides at Miserdine.
41	22	Joseph Roberts, Esq lately died, and his only daughter and heiress now resides.
41	33	John Timbrell, Esq. resides at Cirencester.
42	11	Ch. Hanbury Tracy, Esq. resides at Toddington-house.
42	16	Westbury-house has lately been sold, and taken down.
108	27	After " Welford," add, " in the parish of Kempsford."

AGRICULTURAL SURVEY

OF THE

COUNTY OF GLOUCESTER.

CHAPTER I.

GEOGRAPHICAL STATE & CIRCUMSTANCES.

SECTION I.—SITUATION AND EXTENT.

THE county of Gloucester extends northward from 51 degrees 28 minutes to 52° 12′ and from 1° 38′ east to 2° 42′ west from London. Gloucester, the county town, is situate at 2° 15′ west longitude, and 51° 54′ 30″ north latitude.

On the north and north-east, the county is bounded by Worcestershire and Warwickshire; on the east by Oxfordshire; on the south-east by part of Berkshire and Wiltshire; on the south and south-west by Somersetshire, and the Bristol Channel; and on the west and north-west by the counties of Monmouth and Hereford.

The form of the county is elliptical, but too irregular in the outline to admit an accurate measurement, by the map, of its superficial extent. Sir Robert Atkyns estimated it at 800,000 acres; but, from chap. 15, sect. 8, this calculation seems too high: it is there stated at somewhat lower, though perhaps rather less than the truth, since parishes that have been measured and inclosed, have in general proved more extensive than the usual estimate had made them.

The greatest length of the county in a north-east direction, from Bristol to the extreme part of Clifford Chambers, is about fifty-four miles in a straight line; and, by the nearest turnpike-road, nearly seventy. In the widest part, from Down Ampney on the east, to Preston, in the Forest district, on the west, at right angles with the former line, more than thirty-three miles.

SECTION II.—DIVISIONS.

The principal divisions of the country are four, viz.

1. *Kiftsgate Division,* which takes in the north and north-east parts, adjoining to Worcestershire, Warwickshire and Oxfordshire; this is again subdivided into eight hundreds, viz. Kiftsgate (Upper and Lower), Slaughter (Upper and Lower), Tibbaldston, Cleeve, Cheltenham, Deerhurst (Upper and Lower), Tewkesbury (Upper and Lower), Westminster (Upper and Lower).

2. *Seven Hundreds Division,* extends to the south and south-west of the last, with Oxfordshire and a small part of Berkshire, near Lechlade, on the east, and Wiltshire on the south. This is again subdivided into seven hundreds, viz. Cirencester, including Crowthorne and Minety; Brightwell's Barrow, Bradley, Rapsgate, Bisley, Longtree and Whitstone.

3. *Forest Division,* bounded on the west by the river Wye; on the north-west by Herefordshire and part of Worcestershire, and on the east by Kiftsgate and Seven

Hundreds Divisions in part; but more southerly, that is, from about four miles below Gloucester, by the Severn. This is again subdivided into six hundreds, viz. Botloe, Dutchy of Lancaster, Westbury, Bledisloe, St. Briavels, and Dudstone and King's Barton united, but distinguished by Upper, Middle, and Lower.

4. *Berkeley Division*, bounded by the Severn on the west, part of Dudstone and King's Barton on the north; Seven Hundreds Division on the east, and the Lower Avon, or Somersetshire, on the south. This is again subdivided into seven hundreds, viz. Berkeley (Upper and Lower), Grumbald's Ash (Upper and Lower), Pucklechurch, Barton Regis, Langley and Swine's-head (Upper and Lower), Thornbury (Upper and Lower), and Henbury (Upper and Lower).

In the several hundreds before mentioned, are comprehended the following parishes and places.

*I. KIFTSGATE DIVISION.**

KIFTSGATE HUNDRED.

UPPER PART.

Ashton-Subedge
Battsford
Chipping Camden, M. T.
Condicote (part of)
Cow-Honeybourne†
Dorsington
Ebrington
Larkstoke‡
Longborough
Marston Sicca
Mickleton
Pebworth
Quinton
Saintbury

---

* In the following catalogue the names are written as they are found in the County Rate, printed by order of Sessions.

† Cow-Honeybourne is a hamlet with a ruined chapel belonging to Church-Honeybourne, in Worcestershire.

‡ Larkstoke is a hamlet belonging to Ilmington, in Warwickshire.

Seasoncote
Upper Swell
Weston Subedge
Weston-on-Avon
Willersey.

LOWER PART.

Ashton Somerfield
Buckland
Charlton Abbots
Child's Wickham
Didbrooke
Dumbleton
Guiting Lower
Guiting Temple
Halling
Hayles
Pinnock
Rowel[*]
Snowshill
Staunton
Sudeley
Toddington
Twining
Winchcomb, M. T.
Wormington

SLAUGHTER HUNDRED.

UPPER PART.

Addlestrop
Bledington
Broadwell
Iccomb[†]
Oddington
Stow, M. T.
Lower Swell
Westcote
Condicote (part of)
Eyeford[‡]

LOWER PART.

Great Barrington
Little Barrington
Bourton-on-the-Water
Clapton
Naunton
Great Risington
Little Risington
Wick Risington

---

[*] Rowel is an extra-parochial place; it had formerly a chapel, but no remains are left.

[†] Iccomb is a hamlet belonging to a parish of the same name in Worcestershire.

[‡] Eyeford has usually been considered as a hamlet of Upper Slaughter, but is in fact independent of it, and extra-parochial.

Sherbourne
Upper Slaughter
Lower Slaughter
Widford
Windrush

TIBBALDSTON HUNDRED.

Ashton-under-Hill
Beckford
Hinton-on-the-Green

CLEEVE HUNDRED.

Cleeve with its tythings

CHELTENHAM HUNDRED.

Charlton Kings
Cheltenham, M. T.
Leckhampton
Swindon

DEERHURST HUNDRED.

UPPER PART.

Coln Dennis
Compton Parva
Preston-upon-Stour
Welford

LOWER PART.

Deerhurst
Lye
Prestbury
Staverton
Wollastone
Tirley and Hawe (part of)
Uckington, in Elsmstone Hardwick

TEWKESBURY HUNDRED.

UPPER PART.

Alderton with Dixon
Bourton-on-Hill
Clifford Chambers
Lemmington
Prestcote
Shennington
Stanway
Washbourn
Part of Ashton-under-Hill
Didcoat, in Beckford

LOWER PART.

Ashchurch, or Ashton-on-Carant
Boddington and Barrow
Forthampton

Kemmerton
Oxenton
Tewkesbury, M. T.
Treddington
Walton Cardiffe
Part of Stoke Orchard, in Cleeve

WESTMINSTER HUNDRED.

UPPER PART.

Moreton-in-Marsh
Sutton (under Brayles)
Toddingham
Part of Bourton-on-the-Hill

LOWER PART.

Corse
Elmstone-Hardwick
Evington, in Lye
Hasfield
Tirley
Heydon and Withy Bridge, in Boddington
Apperley, Whitfield, & Walton, in Deerhurst

II. SEVEN HUNDREDS DIVISION.

CIRENCESTER HUNDRED.

Cirencester

CROWTHORNE and MINETY HUNDRED.

Ampney Crucis
Ampney St. Mary
Ampney St. Peter
Badgington
Baunton
Coates
Daglingworth
Down Ampney
Driffield
Dunsborne Abbots
Duntesborne Rouse
Harnhill
Meysey Hampton
Minety
Preston
Syddington St. Mary
Syddington St. Peter
South Cerney
Stratton

BRIGHTWELL'S BARROW HUNDRED.

Aldsworth
Barnsley
Bibury
Coln St. Aldwyns

Eastleach Martyn
Eastleach Turberville
Fairford, M. T.
Hatherop
Kempsford
Lechlade, M. T.
Quinnington
Southropp

BRADLEY HUNDRED.

Aston Blank, or Cold Aston
Coln Rogers
Compton Abdaile
Dowdeswell
Farmington
Hampnett
Hazleton
Northleach, M. T.
Notgrove
Salperton
Sevenhampton
Shipton Olive
Shipton Sollars
Stowell
Turk Dean
Whittington
Withington
Yanworth, in Hazleton
Winstone (part of)

RAPSGATE HUNDRED.

Brimpsfield
Chedworth
Colesbourne
Cowley
Cranham
Cubberley
Elkstone
North Cerney
Rendcombe
Syde
Dunsborne-Lear, in Dunsborne Abbots

BISLEY HUNDRED.

Bisley
Edgeworth
Miserden
Painswick, M. T.
Sapperton
Stroud, M. T.
Winstone (part of)

LONGTREE HUNDRED.

Avening
Cherington
Minchin-Hampton, M. T.
Horsley

Lasborough*
Rodborough
Rodmarton
Shipton-Moyne
Tetbury, M. T.
Weston Birt
Woodchester

WHITSTONE HUNDRED.

UPPER PART.

Fretherne
Haresfield
Longney
Moreton Valence
Quedgeley
Randwick
Saul
Standish, or Oxlinch
Hardwick

LOWER PART.

Eastington
Frampton (upon Severn)
Frocester
King Stanley
Leonard Stanley
Stonehouse
Wheatenhurst, or Whitminster

III. FOREST DIVISION.

BOTLOE HUNDRED.

Bromsberrow
Dymock
Kempley
Newent, M. T.
Oxenhall
Pauntley
Rudford
Taynton
Upleaden

DUTCHY OF LANCASTER.

Bulley
Huntley
Longhope
Minsterworth
Tibberton

WESTBURY HUNDRED.

Blaisdon
Churcham

---

* Lasborough is not in the county rate, but is probably included in Weston Birt.

Newnham, M. T.
Tiddenham
Westbury
Woollaston

BLEDISLOE HUNDRED.

Awre
Alvington
Lidney

St. BRIAVELL's HUNDRED.

Abinghall
English Bicknor
Flaxley
Hewelsfield
Little Dean
Mitchel Dean, M. T.
Lea
Newland
Ruardeane
St. Briavell's
Stanton
Coleford, in Newland, M. T.

DUDSTONE and KING's BARTON HUNDRED.

UPPER PART.

Badgeworth
Barnwood
Brockworth
Church Down
Down Hatherley
North Hamlets*
Norton
Sandhurst
Great Shurdington
Great Witcomb

MIDDLE PART.

Barton Hamlets†
Brockthrup
Elmore
Harescomb
Hempstead
Matson
Pitchcomb
South Hamlets‡

---

* The North Hamlets comprehend King's-holm, Longford, Twigworth, Wotton, Vineyard-hill, Walham, Alney Isle, part of Little Mead, Castle of Gloucester, St. Margaret's Hospital, and that of St. Mary Magdalen; all lying to the north, north-east, and west of the city.

† Barton Hamlets are those parts of the parishes of St. Mary de Lode and St. Michael, that adjoin the city, but are in the county.

‡ The South Hamlets comprehend, the Upper and Lower Sheephouse, Lanthony, Newark, Rigley-stile Grounds, and Sud-

Upton St. Leonard's, with Prinknash
Whaddon
Woolstrop, in Quedgeley

LOWER PART.

Hartpury
Highleadon and Highnam
Lassington
Maisemore
Preston

IV. BERKELEY DIVISION.

BERKELEY HUNDRED.

UPPER PART.

Arlingham
Ashelworth
Berkeley, M. T.
Beverstone
Cam
Coaley
Cromhall
Dursley
Kingscote
Newington Bagpath
Nympsfield
North Nibley
Owlpen
Ozleworth
Slimbridge
Stinchcomb
Stone
Uley
Wotton-under-Edge, M. T.

LOWER PART.

Almondsbury
Elberton
Filton
Hill
Horfield
Kingsweston, in Westbury

GRUMBALD's ASH HUNDRED.

UPPER PART.

Alderley
Great Badminton
Boxwell
Charfield
Didmarton
Hawkesbury
Horton
Leighterton

brook, all extra-parochial: but Littleworth, which is also extra-parochial, and Upper and Lower Tuffley, hamlets to St. Mary de Lode, are usually included in the historical accounts of them.

Oldbury-on-the-Hill
Tortworth
Wickwar, M. T.

LOWER PART.

Acton Turville
Doddington
Dirham and Hinton
Chipping Sodbury, M. T.
Little Sodbury
Old Sodbury
Tormarton
Wapley and Codrington
West Littleton
Acton Ilgar, in Iron Acton

PUCKLECHURCH HUNDRED.

Cold Ashton
Pucklechurch
Siston
Westerleigh
Wick and Abson

BARTON-REGIS HUNDRED.

Clifton
Mangotsfield
Stapleton
St. James and St Paul } Out parishes.
St. Philip and Jacob }
St. George's, formerly part of St Philip and Jacob

LANGLEY and SWINESHEAD HUNDRED.

UPPER PART.

Bitton
Doynton
Frampton Cotterel
Winterbourne

LOWER PART.

Alvestone
Littleton
Hampton and Patchway } In Almondsbury.
Over }
Olvestone
Rockhampton

THORNBURY HUNDRED.

UPPER PART.

Marshfield, M. T.

LOWER PART.

Iron Acton	Titherington
Rangeworthy	Gaunt's-Arcott, in Almondsbury
Thornbury, M. T.	

HENBURY HUNDRED.

UPPER PART.

Compton Greenfield	Itchington, in Titherington
Stoke Gifford	Charleton and Aust, in Henbury
Yate	

LOWER PART.

Henbury	Westbury-on-Trim

The foregoing is the political division of the county; but the natural division, and what is best adapted to an agricultural survey, is into Cotswold, Vale and Forest. The Cotswold District comprehends the whole tract of hill country from Chipping Campden northward, to Bath, and is often divided into the Upper and Lower Cotswolds, or the Hills. The Vale takes in the whole lowlands from Stratford-upon-Avon to Bristol: it is usually divided into the vales of Evesham, Gloucester, and Berkeley; perhaps a better division would be into the vales of Severn and Avon. These rivers are natural boundaries: the former comprehends all the low country between Tewkesbury and Bristol; and the latter, the lowlands between the Upper Cotswolds and the Avon from Tewkesbury to Stratford, wherever that river is a boundary to the county. The Forest District includes the parishes on the west side of the Severn up to Gloucester, and afterwards on the west side of the river Leden till it enters the county of Hereford.

SECT. III.—CLIMATE.

Cotswolds. The temperature of these is similar to others under like circumstances. In districts where the north and north-easterly parts are sheltered by forests, or belts of thick woods, the currents of air are checked in their progress, and may possibly acquire a certain degree of warmth by the repeated collisions of the aerial particles among each other, as well as the opposing leaves, branches, and bodies of the trees. The unsheltered state of the Cotswolds exposes them to the full effects of bleak winds, and, therefore, throughout the whole extent, a sharp climate is predominant. In the dens and small vallies, a milder air is felt; and in consequence of this, in former times, the villages were generally built in these; but since the cultivation of the higher lands, the conveniences resulting from a central situation, with regard to the farm, have occasioned the building of houses in very exposed situations. Hence has arisen a hardy race of men; and the hill farmer is easily distinguished, by his complexion, from the husbandman of the vale.

Vale. Here the air is comparatively mild in very severe weather; the difference is perceptible immediately on beginning to descend from the hills, where oftentimes the snow has a considerable depth, when the vale exhibits no appearances of the kind.

In the vale of Gloucester one cause is assignable, which does not apply to other places. The direction from south-west to north-east, lays it open to the influence of the mild breezes blowing from the former quarter, which, being conducted from the Atlantic by the Bristol Channel and Severn, are diffused through the vale. This observation, however, does not so accurately apply to that passage of country which lies between Campden and Stratford, and is said to be earlier by a fortnight than the lower vale. The difference of latitude is too trifling either to accelerate or retard the period of maturity, and the management is not superior to that of other parts; but the soil is remarkably fertile, and few spots of the same dimensions (about 20,000 acres) are so completely sheltered on every side from which the cold winds blow. A south-west exposure has also its disadvantages; for though the currents of air are generally mild, yet they are oftentimes violent, and turbulent, and great devastation among the fruit trees marks their progress. The winds which blew with such violence at the beginning of 1804, and particularly on the 27th of January, came from this quarter.

The Forest. The climate of this district is usually considered as equally temperate with the vale. The high and exposed parts are so much sheltered by thick woods, that neither northerly or easterly winds can affect them to any considerable degree of severity.

In some parishes of this district, as Churcham and all the Ryelands,* the harvest is generally a fortnight earlier than in any part of the vale, except, perhaps, the higher parts of the vale of Avon. At Churcham the lands lie on a gentle slope towards the rising sun, and from that circumstance are supposed to acquire a quicker vegetation: on the Ryelands, it is owing to the soil, which being a sand, almost unmixed with any substance but the manure, forces the growth of seeds, and, soon losing its moisture, is deprived of the necessary supply of juices, which brings on an early maturity.

---

* See next section, *sub Forest.*

SECT. IV.—SOIL AND SURFACE.

Cotswolds. The soil on these is a shallow calcareous loam, provincially Stonebrash. The general depth is four inches, seldom exceeding seven. Under this is a stratum of rubble, or mould and fragments of stone, of the same nature as the rock on which the whole rests, which is a calcareous sand-stone, differing in some qualities, but usually known by the general name of freestone, when found in large masses and deep beds. The upper soil consists of sand or grit produced from the decomposition of the rocks, the roots of vegetables, which have gradually covered the bare parts, and the dung of sheep that have immemorially been depastured upon it. The natural barrenness of the sand is, however, in some parts, with difficulty conquered; having no clay in the mixture to give it tenacity, it neither adheres to the roots of the plants, nor retains the principles of fertility, which the other component parts are capable of supplying. It is often known (and was particularly the case in 1803,) that strong easterly winds blow the mould away from the wheat in the month of April, and lay the roots almost bare. To remedy this, or provide against it, the land is trodden with sheep and other cattle, not only by folding immediately after the wheat is sown, but by driving them repeatedly over it, in the spring. This process not only gives firmness to the soil, but is thought also to check the growth of poppies and other weeds, to which the land is subject.

This is the general character of the hill soil; but in some parts it inclines more to clay, especially on the declivities, where it assumes a more tenacious quality, and may be ranked in the argillaceous class, hardening with dry weather, and adhesive in wet. Of this kind also is the soil in the numerous small vallies, which so frequently make a break in the hills. It would be difficult to find, in any part of the vale, either a deeper or more argillaceous stratum, than occurs on the banks of the rivulets that run through these.

There is a part of the Cotswolds, lying chiefly to the south of the turnpike-road from Oxford to Bath, which has a soil very different in nature from that first described. It extends, more or less, from Burford, through Cirencester and Tetbury, to Bath. The surface-soil consists of a mixed loam, to the depth of from nine to twenty-four inches, under which lies a stratum of rock in thin lamina, rubbly or broken, and mixed with light loam, to the depth of from four to twenty-four inches, and then a stratum of clay of various depths. This land is naturally wet, and rots sheep pastured on it, owing to the water in heavy rains sinking through the upper surface, and lodging in the second stratum, where it is retained; and when additional rains fall, this stagnant putrid water, not finding a vent below, is forced back upon the surface, and materially injures the vegetation of all the most valuable plants growing upon it. This soil is, however, interrupted by large breadths of land of very stiff clay, and others of a good loamy sand. There is very little or no freestone rock under this land, till nearly the depth of from sixty to a hundred feet, where a rock is frequently found. A considerable part of the above soil has been effectually drained by cuts across the natural fall of the land, through the two first strata, filled with stone up to the good soil, and covered at top with earth: it then becomes highly valuable either for pasture, dairy, or tillage, and sheep may be fed on it with safety from the rot. A great proportion of the above tract of land is applied to the dairy, and produces excellent cheese, similar in quality to the North-Wiltshire.

Vale. The soil in the Vale is various; in the northern parts of the county, as at Welford, and its immediate neighbourhood, it is a fine black loam, mixed with small pebbles, very quick in vegetation, and uncommonly productive; more to the south, it changes to a strong clay, retentive of water, and opening into chasms with drought, but rich in its nature and remarkable for abundant crops. These appearances continue more or less to the neighbourhood of Tewkesbury, from which place to Gloucester, on each side of the Severn, is found a red loam; a soil formed from the long continued and annual deposits of the muddy water, which being brought down the Teme (a Herefordshire river) after great rains, inundate the meadows adjoining. Some lands which lie out of the reach of modern floods, have a considerable depth of this upper soil, as if at some remote period the superfluent water extended much wider than at present, till deep and capacious channels were formed for their reception.

This adventitious soil is highly fertilizing, superseding the necessity of manure on the meadow lands within its influence; and, being an argillaceous substance without calcareous mixture, is exceedingly useful for the purpose of making brick and tile, as well as for manuring light sandy lands. A similar soil continues, with few interruptions, for ten miles below Gloucester; but being at that distance impregnated with sea-water salt, and mixed with sand which the tide has deposited, it loses much of its tenacity, though equally, if not more productive. The bricks, which are made of it, never lose entirely the effects of the salt water, but give out a degree of damp on every change of the weather to wet.

At a distance from the Severn, on the eastern side, the soil is a strong clay, extending to the base of the hills, and in some places particularly untractable. The latter observation holds good more truly in detached parts, where there is no draught to carry off the surface water, and the soil is too retentive to absorb it; for where the improving system of underground draining has been adopted, large portions of land, before little valued, have been brought to a state of great melioration.

In the parishes of Deerhurst, above Gloucester, and Berkeley, Rockhampton, &c. below it, as also at Iron Acton, Winterbourn, and Frampton Cotterel, the soil is of a strong ferruginous colour; in the former it is argillaceous; in the latter a sandy loam; but the colouring principles of both are probably derived from the oxyde of iron which they contain, and possibly the great fertility of these soils is owing to the same cause. Sandy soil, with a substratum of gravel, is found in a small portion of the county. In the neighbourhood of Gloucester, it extends from Longford, nearly to Robin's-wood-Hill; in a part of this line, the surface soil is combined with clay, as is also the gravel underneath. At Frampton-upon-Severn, and eastward of it, another stratum of gravel occurs, and the surface soil is light. At Slimbridge the same appearances are again found. The space of ground occupied by these strata, do not comprehend a circle of more than seven miles diameter, which is small in comparison of the superficial extent of the county. Gravel is to be found in other parts, but not in sufficient quantities to merit particular notice.

In all parts of the vale, except where the compact lime-stone rocks are found, a blue clay forms the substratum, at different degrees of depth, to every soil. It is always next to the common clay, and generally under the beds of gravel and sand. Sometimes it is preceded by a layer of marl; and in some places, particularly in the parish of Hardwick, it becomes the surface soil. It is in its nature unfavourable to vegetation; for though the lands just mentioned have been in pasture for time immemorial, they are still cold, sour, and unproductive of any but the coarsest herbage. Underground draining promises but little assistance, because the clay is impervious to water; and perhaps the present method of open "grips" or channels is the best for carrying off the surface water, while it is continued in pasture; but it would be a better practice, and more likely to bring it into a productive state, to plough up, and so keep fresh surfaces frequently exposed to the sun, air, and frost, at the same time separating the strongly adhering particles, by the admixture of coal ashes, sand, and similar substances. With this blue clay are sometimes found small calcareous fragments, which make it unfit for burning into brick. When the bason of the Berkeley Canal was dug, this clay, which was found at the depth of a few feet, was converted to brick, but the small particles of lime-stone, which were burnt with it, on the absorption of moisture, slaked, and burst the greatest part of them.

In the higher parts of the vale, is some peaty earth, but not in abundance. This appears, like other soils of the same nature, to be the remains of vegetable substances; it lies three or four feet deep, burns freely, and produces strong ashes, but is not used for fuel.

Forest. Throughout a considerable part of this district, the soil inclines to sand, which in the northern parts is very keen; being little more than a decomposition of the red sand-stone, which is embedded in large rocks to a great depth, and often rises to the surface. This takes in a general description of the Ryelands, within the parishes of Bromsberrow, great part of Dymock, Pauntley, Oxenhall, and Newent, on the high grounds; but on the lower, and nearer to a level with the river Leden, the soil is of a more close and strong texture, though retaining the same colour. Between Newent and Gloucester, it is nearly the same, till within a mile and a half of the city, where it changes to a black earth, intermixed with siliceous pebbles.

The southerly parts of this district have a light soil, or sandy loam; often of a ferruginous colour, like the lower part of the vale. In that portion, strictly called the Forest, a kind of peaty soil prevails, interspersed with bogs, and yellowish or ochreous clay.

In the foregoing distribution of soils, the general character only of the county is attempted; it would be tedious and useless to remark every transition, on so large a surface of land; especially where the transitions are sudden and frequent.

SECT. V.—MINERALS.

The Cotswolds contain no metallic ores, as far as discoveries have hitherto been made.

In the Forest of Dean, iron ore is in great abundance, but a small quantity only is raised. The greater part used in the furnaces is brought from Lancashire, which, under all the expences of carriage, on account of its richness, is more profitable for working. Charcoal is chiefly employed in making the best wrought iron; coke, made from the Forest coal, answers the purpose for cast iron, and that which is rolled into plates for tinning.

In the lower part of the Vale, veins of lead are found in almost all the lime-stone rocks; some attempts have been made to work them, but they have hitherto proved too trifling to answer the expence.

Coal abounds in almost every part of Dean Forest and its neighbourhood, and probably within a small distance of Gloucester. The nearest pits to the city are, however, at Newent and Pauntley, distant nine or ten miles. These are yet in their infant state, and have not been worked deep enough to ascertain either the goodness of the coal, or the quantity they are likely to supply.

The pits in the Forest are numerous, not fewer perhaps than one hundred and fifty. Many of these are worked at a shallow depth, for want of mechanical powers to exhaust the water. The steam-engine, on account of the great expence of erecting it, is beyond the reach of those who generally own and work the pits: for all free-miners and colliers claim a right to dig for coal and ore; and as they are a species of adventurers without capital, few of the modern improvements can be expected to take place. There are, however, at this time, three engines; and, from the pits connected with them, coal of good quality has already been raised; though in all, much sulphur is contained, which in burning emits unpleasant, if not unwholesome, vapours, and from its known property of dissolving iron, makes a rapid waste in the bars of the grates, wherein the coal is burnt.

Three sorts are delivered from the Forest pits: house coal for the use of the kitchen, at about seven shillings per ton; smiths' coal, at five; and lime coal, at four. The lower part of the vale, including the parishes of Cromhall, Yate, Iron Acton, Westerleigh, Pucklechurch, Stapleton, Mangotsfield, Bitton, Siston, and St. George's, within the Forest of Kingswood, equally abound in coal, but of a less sulphureous quality. The pits within this district are very numerous, and supply, besides that of the neighbourhood, the vast consumption of the Bristol manufactories, and in some degree of Bath. Here every advantage is derived from the steam-engine, and the pits are sunk to the depth of sixty fathoms or more. The price, at the pit's mouth, is about eight shillings per ton, or nearly three shillings per quarter, of eight bushels.

The heavy expence of land-carriage prevents any assistance, from the pits before mentioned, being derived by the inhabitants of Gloucester, except in times of great scarcity, arising from an obstruction of the navigation on the Severn by drought or frost. This valuable article of domestic œconomy, is brought down for the supply of the city and neighbourhood, from Shropshire and Staffordshire. The coal from either place is much superior to any produced in the county; the Staffordshire, in particular, burns in the most free manner, and perfectly discharged from noxious or disagreeable vapours.

The Forest of Dean, Longhope, and adjoining places, furnish a good lime-stone of the compact kind, for building and agriculture; but inferior to that which is found in vast beds at the southern extremity of the county, beginning at Cromhall, and expanding on each side elliptically, till the rocks meet again in Somersetshire. Within this circle, it is said, that coal is every where to be found.

The lime made from this stone is of a peculiar whiteness and great strength: that which is burnt at St. Vincent's rocks, near Bristol, is the best. The lime, when slaked, is compressed closely in casks, and becomes a considerable article of foreign and internal commerce. For the purposes of agriculture it is highly valued, and superior to any which is made from the calcareous grit of the Cotswolds, or the blue clay-stone of the vale.

Blue clay-stone is found at different depths in beds of clay of the same colour, and, being disposed in layers of from four to ten inches thick, is useful for building. Experience discovers the goodness of the stone; for, however hard and sound it appears to the eye, yet, when exposed to the atmospheric moisture, or frost, it will often be decomposed and fall to pieces. In estimating the value of stone, therefore, in a new quarry, or pit, it is usual to subject it for one winter to the influence of the season. This stone is advantageously converted to lime for all purposes, and on some estates kilns are erected to supply manure for the land. Free-stone of excellent quality for building is raised from the Cotswold quarries, particularly at Painswick, Sodbury, Leckhampton Hill, &c. Block free-stone burns to a weak lime, but near to the surface there often lies a course of stone, about a foot thick, which makes tolerable lime; it is, however, not often converted to that purpose, on account of the great expence of fuel. Paving stones of various qualities and colour are dug in the quarries at Frampton Cotterel, Winterbourn, Iron Acton, Mangotsfield, Stapleton; and in the Forest of

Dean, are found these, and also grits of various degrees of fineness for grind-stones; and one of extraordinary hardness and durability, probably the best in the island, for cyder-mills.

Stone tiles are principally raised on the Cotswolds in different parts; the best are prepared at Miserdine, Bisley, Beverstone, Charlton in the parish of Tetbury, Hampton-field, and Ablington in the parish of Bibury. The colour of these are yellow, or grey; but another sort of red grit is dug at Iron Acton, and some adjoining places; as these, however, separate into thick lamina, and of course require strong timbers for their support, they are less eligible than the former; all stone tiles indeed, on account of their weight, are not so much used as those which are burnt from clay, or the light blue slate from Wales, where not prevented by the expence of carriage.

Aust Cliff, in the parish of Henbury, has a fine bed of alabaster (gypsum), which furnishes a plentiful supply for stuccoeing, &c. to the masons of Bristol, Bath, and other places; and might doubtless be employed to advantage in agricultural improvements, though it has not yet found its way into practice in this neighbourhood.

Derbyshire alabaster is esteemed of superior value by the marble masons, and is sold at Gloucester Quay, for fifty shillings per ton, while that from Aust, is so low as twenty-two.

SECT. VI.—WATER.

The principal rivers are, the Severn, the Isis or Thames, Upper Avon, and Lower Avon.

1. The Severn has its source in Plinlimmon Hill, county of Montgomery, bearing there the name of Haffren, as it flows towards Llanidloes. At Newtown it takes the name of Severn, and continues a northerly course to Landrino, at which place it turns to the east, and proceeds to Shrewsbury. Having flowed almost round this town, it descends in a south-east direction to Colebrook-Dale, and afterwards more southerly to Bridgenorth, Bewdley, Worcester, Tewkesbury, and Gloucester. Here is the last bridge over it, and the width begins to increase considerably as it passes Framilode, Newnham, and Thornbury; soon after which it takes the name of the Bristol Channel, and forms a grand estuary, not less than ten miles wide, still increasing, until it is incorporated with the Atlantic Ocean. This course is nearly 300 miles, and in this great extent the following tributary streams assist its consequence.

The Upper Avon, is the highest in the county, and falls in at Tewkesbury.

The Chelt, which rises at Dowdeswell, and runs by Cheltenham, emptying itself near Wainlode-hill.

The Leden, which, rising some miles above Ledbury, county of Hereford, enters this county at Preston, in the Forest district, and falls into the western channel of the Severn, below Over's-bridge.

The Upper Frome, rises at Brimpsfield, in Rapsgate hundred, passes Stroud, where it is called the Stroud River, intersects the turnpike-road leading from Gloucester to Bristol, near the eight mile stone, and joins the Severn at Framilode Passage. Another stream, called Avon, which rises at Avening, and is joined by a rivulet from Horsley, at Nailsworth, falls into the Frome at Dudbridge, a mile below Stroud. These are said to possess some peculiar qualities, which are found useful in the cloth manufacture, and particularly the dyeing branch of it. May not these qualities be acquired from the calcareous beds over which their waters run? Of the utility of the streams, there can be no question, when the various works, which are crowded on their banks, and the acknowledged superiority of the goods here manufactured, are considered.

The Ewelm rises at Owlpen, passes Uley, and at Dursley is increased by the waters of the Broadwell. At Cam it adopts the appellation of the place, gives name to the hamlet of Cambridge, a little below, and falls into the Severn at Frampton Pill.

The Middle Avon rises at two heads; one in Newington Bagpath, which passes through Lasborough Park to Boxwell; the other in Hawkesbury, which passes by Wickwar; and both streams uniting below Kingswood, county of Wilts, intersect the Bristol road at Stone, and having washed the walls of Berkeley Castle, join the Severn about a mile below the town.

The Lower Avon rises among the hills of North Wiltshire, and passing by Chippenham, enters this county near Bath, where it is first navigable. At Bitton, in its course to Bristol, it receives the Boyd, and other small streams. A branch of the Avon rises in the parish of Tetbury, where, forming a rivulet, it becomes the boundary between the counties of Gloucester and Wilts, for about three miles; it then crosses the antient Akerman-street, and below the town of Malmsbury joins the other branch before mentioned. At Bristol the Lower Frome, rising in Dodington Park, and having received the Laden at Frampton Cotterel, forms part of the harbour, before it unites its waters with the Avon, which then flows on about five miles, and joins the Severn at Kingroad.

The tide, well known in the Severn for its boisterous and impetuous roar, comes up to Gloucester with great rapidity and violence, and turns the stream as high as Tewkesbury. The greatest elevation occasioned by the tide at the quay at Gloucester, is nine feet; but the most usual is seven feet and a half. The saline impregnation is soon lost after it has passed Framilode Passage.

The produce of the Severn, is roach, dace, bleak, flounders, eels, elvers, chub, carp, trout, and perch. These are properly fresh-water fish, and the three last, though often found here, do not naturally belong to it, but come in with the tributary streams, or accidentally from ponds. Salmon, lampreys, lamperns, shad, *soles*, shrimps, *cod*, plaice, *conger eel*, *porpoise*, and *sturgeon*, with some others, belong to the sea, but are taken within the limits of the county. Those which are printed in Italics, are seldom found higher than Berkeley Pill.

The salmon, which has ever been reckoned the pride of the Severn, and in former times caught in great abundance, is become comparatively a scarce fish. A considerable decrease of the species, difficult to be accounted for, satisfactorily, is allowed by all who are employed in this branch of fishery. Great mischief is thought to be done by the use of small mashed nets, which take the young fry, generally known here by the name of samlet. The alliance of these to the salmon is disputed; it is, however, known that they also are much diminished in quantity.* It is also thought, that the custom of taking the old fish at an improper season of the year, is highly prejudicial to the increase of salmon. Unquestionably millions are destroyed in the spawn by this illegal practice; and the fish themselves, taken either when they are going up the river just ready to spawn, or immediately on their return from spawning, are of little value, possessing neither colour, flesh, beauty, or flavour. The price of salmon, in high season, is often three shillings per pound, seldom lower than eighteen-pence.

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* In 1803 some samlets were taken, about four miles below Gloucester, and thrown back into the river, with their fins cut; in the following season they were again taken, having in one year increased to three pounds weight. This fact I had from a respectable gentleman, who is largely concerned in fisheries, and have, therefore, no reason to question it.

2. The Upper Avon, rises on the borders of Leicestershire, enters Warwickshire at Colthrop, passes Rugby, Warwick, and Stratford, where it becomes navigable. A little below, it receives the Stour; and having been a boundary to the county of Gloucester two or three miles, pursues its slow course to Evesham and Pershore, and after having flowed about three miles in this county, unites its waters with the Severn, at Tewkesbury.

The produce of this river, is roach, dace, bleak, carp, bream, and eels. It is remarkable, that the bream never leaves the quiet waters of the Avon, for the more rapid stream of the Severn; nor does the salmon, at the conflux of the two rivers, ever leave the Severn for the Avon.

3. The Isis or Thames, is generally reputed to rise at a spring called Thames Head, in the parish of Cotes, in this county: near Cricklade, county of Wilts, it receives the Churn, (a small river which rises at the Seven Springs, in Cubberley, and passes by Cirencester,) enters this county again at Kempsford, continues the southern boundary of it to Lechlade, and there entering Oxfordshire, pursues its course to the metropolis.

4. The Winrush, not navigable, but famous for its fine trout and cray-fish, rises at Upper Guiting, and

P. 29.

passes through Bourton-on-the-Water, in its way to Barrington, where it leaves this county, and, flowing by Burford, falls into the Thames, at Newbridge, county of Oxford. In its course, it receives several small streams; of which the principal are the Coln, rising at Sevenhampton, the Lech, rising near Sherborne Lodge, and the Dickler, commencing at Spring-hill, a seat of Lord Coventry, in the county of Worcester. All these last-mentioned rivers and streams abound with trout.

CANALS.

The Stroud-water Canal begins at Walbridge, in the parish of Stroud, and opens by a lock into the Severn at Framilode. The width is 42 feet; the length 7 miles, 6 furlongs, and 8 chains and a half; the rise above the level of the Severn, 102 feet 5 inches. The advantages of this canal to the commercial interests of the clothing manufacture, were improved by a junction of the Severn with the Thames, which was effected by a continuation of the line from Walbridge to Lechlade; and on the 19th of November, 1789, the first boat laden with goods passed into the Thames, along the Thames and Severn Canal. The length from Walbridge to Lechlade is 28 miles, 6 furlongs, 2 chains and a half: the general width is 40 feet at top, and 30 at bottom. It rises, in the course of 7 miles and 5 chains to Danaway-bridge, 241 feet 3 inches; and after having reached Upper Siddington, a distance of 8 miles, 8 chains and a half, on a level, it falls 102 feet 2 inches, in its progress to Cricklade; and 28 feet 4 inches more, before it reaches Lechlade. To avoid a great elevation of ground, a tunnel was cut through Saperton-hill, which emerges in Cotes field. The depth from the surface is 240 feet; the length, 2 miles and 3 furlongs; the height 15 feet, and width the same, including 6 feet of water.

The Berkeley Canal, was intended to form a shorter and more easy, as well as more safe communication for vessels of large burden, between Gloucester and the Severn, in its wider parts. The expectations of the first projectors were sanguine, and probably well grounded; but the calculations which were made of the supplies necessary to the completion of it, proved so erroneous, that after 120,000*l.* had been expended, scarcely 5 of 17 miles and a half were finished. The bason, at Gloucester, was begun in 1794; the canal is 70 feet wide at top, 20 at bottom, and 18 deep.

The Hereford and Gloucester Canal, was projected to open a communication by water, from the former city, with Ledbury, Gloucester, Bristol, London, &c. The produce of the interior country is considerable; consisting of coal, timber, cyder, black poles, bark, corn, hops, &c. The trade of the city of Hereford alone, was computed at upwards of 40,000 tons annually. The canal was begun in 1792, and is now navigable from Gloucester, nearly to Ledbury, a distance of about 17 miles. It joins the Severn a little below the Westgate-bridge, is continued from thence on a level over the west channel, then, rising by a lock, crosses the Leden by an aqueduct. At Oxenhall, it passes through a tunnel of 2170 yards, at the depth of 126 feet from the surface, and emerging at Dymock, proceeds to Ledbury, and, when finished, to Hereford. The whole of the lockage will be 235 feet 8 inches. The expence already incurred is 105,000*l.* of which, 40,000*l.* belong to the tunnel. The want of a regular supply of water has, hitherto, interrupted the full advantages that were fairly expected to result from the plan.

PONDS FOR WATER.

On the stone-brash soils of the Cotswolds, the following method is practised:

They are made either square or circular, and generally so situated as to furnish a supply to four fields. The depth, when fourteen yards over, is five feet; when twenty, eight.

The sub-rock of this district being full of fissures, or rubbly stones, artificial methods are used to retain the water. Three layers of clay are worked in, above each other, at the bottom and sides, and are compressed so firmly by beating, as to form an impenetrable cement. Water is sprinkled on occasionally during the process, to keep the clay in a proper temper for working, and prevent cracks. Care is taken, that no small stones or gravel be worked in with the clay, which might leave openings for the insinuation of the water. The whole is afterwards covered with sand, and finished with pitching or pavement.

In the Vale, little pains are taken in the formation of drinking pools. In a part of the field, most convenient on account of its easy communication with a rill, or running stream, an oblong square excavation is made, shallow at the entrance, and sloping down to the depth of six or seven feet. The size is determined by the quantity of water supposed to be wanted, and the probability of replenishing it. The entrance is guarded for seven or eight feet with stone pitching, and the sides are usually raised with the soil thrown out. Clayey soils are sufficiently tenacious to retain the water; none of which can escape, except from evaporation, or the drinking of the cattle. In consequence of the cattle treading down the sides, and the accumulation of leaves and other substances, pools of this description require to be "thrown" or cleansed every seven or eight years, which is the work of spring, that they may be filled again, if no running stream communicates, by the first rains which fall.

As springs seldom occur in these clays, serious inconveniences are sometimes experienced from a long continuance of dry weather, in the summer season; it is, therefore, an object of great attention, to make the pools large at first, and to keep them well cleansed afterwards.

In those parts of the Vale, which lie on the substratum of gravel, an opening is made to a small depth, and water seldom fails. As springs, however, vary with the season, a permanent supply in long droughts is best secured, by sinking to a considerable depth into the bed of gravel.

The same observation applies to the lower part of the county, where the soil rests on grit-stone rocks; in in every stone-pit there is plenty of water, and therefore little care is bestowed in the formation of watering pools.

Waters vary much in their qualities, in different parts of the county. In some they are strongly impregnated with iron; in others, so much calcarized, as to incrust substances very powerfully: in both cases they are very cold. Many of the springs which rise in the Forest of Dean, and the lower part of the county, are of the first description, and esteemed salutary; cattle are not observed to refuse drinking at them. Of the second sort are the rivers, which run through the vallies of the Cotswolds; the waters of these are excellent, but are suspected to produce disorders from the petrifying quality they possess. This, however, is doubted by many scientific gentlemen, who consider the calculus to be a mere morbid secretion of animal matter.

Waters, which rise through beds of blue clay, are often strongly saline, as at Prestbury, Cleeve, Cheltenham, Sandhurst, Hardwick, Eastington, &c.; but those of the Severn are of a superior softness; cattle drink of them in preference, when within their reach, and undisturbed by the tide.

CHAPTER II.

STATE OF PROPERTY.

SECT. I.—ESTATES, AND THEIR MANAGEMENT.

The landed property belonging to any individual, is not, perhaps, so large as in some other counties. In the list of proprietors, given in chap. 3, will be seen the names of those noblemen and gentlemen who have estates, and either reside upon them, or let them to tenants. The largest property does not, probably, exceed 8000*l.* a year among the nobility, and from 3000*l.* downward, among the gentry. The number of yeomen who possess freeholds, of various value, is great, as appears from the Sheriff's return of the poll, at the election for a county member in 1776, when 5790 freeholders voted, and the number since that period is much increased.

The great proprietors, in general, let the principal part of their estates to tenants; keeping no more under their own management, than is sufficient to supply the family with articles of domestic consumption, without the necessity of resorting to the market. This partial occupation has the effect of keeping up the spirit of experiment in cultivation, and promotes the improvement of breed among cattle.

The distribution of landed property among so many hands produces a similar result, since the freeholder exerts himself in proportion to his estate; and looks forward to a permanent advantage from improvements, though made at considerable expence.

SECT. II.—TENURES.

The greater part of the property of this county is freehold, some is copyhold, and about a fortieth portion of the whole is held under corporations, ecclesiastical or temporal. A considerable part of the latter has been enfranchised under the late Act of Parliament for the redemption of land-tax.

Estates under the See of Gloucester, are leased out upon lives; and the usual mode is, to renew on the falling of a life, at a year and a half improved annual value of the estate. Three lives in possession, and three in reversion, are upon copyholds. Under the Dean and Chapter, estates are held by leases of twenty-one years, renewable every seven, on a fine of one year and a half improved value.

The tenure under the Corporation of Gloucester is nearly the same.

Under proprietors, not corporate, the renewal of a single life is usually made at two years annual value.

The leases of rack-renters generally commence at Lady-day; and in this case, in the vale, the going-off tenant holds a part of the grass lands to Old May-day, and has, likewise, the going-off crop of wheat, with the use of the barns, for the purpose of housing and threshing it, till the Midsummer following. In this usage there is great inconvenience, especially where the new tenant is at variance with the old one, which is not uncommonly the case. Each have an opportunity of distressing and incommoding the other in various ways. The improved spirit of agriculture has discovered, both to landlord and tenant, the absurdity of this ancient custom; and it is gradually falling into disuse. Where an improvement has taken place, the coming-on tenant enters the preceding Michaelmas to plough the land for the spring crops; the tenant going off at Lady-day ploughs for the wheat crops, and often sows it. In the case of ploughing only, the work is paid for; and when sowed, the crop is valued at Lady-day, and paid by the coming-on tenant. The going-off tenant is also frequently paid for his seeds left after the last year's crops. Under this practice the new tenant enters upon the whole of the estate at Lady-day.

Michaelmas takings are not uncommon, though, in one respect, they are particularly inconvenient, as the old tenant has no time to spend the crops of the preceding summer on the premises, and the new tenant is either obliged to sell his stock at a most unfavourable time, or purchase fodder for the support of it at his new farm; a circumstance he cannot always command, and when he can, at great loss.

Other takings commence at Candlemas, which has some conveniences, particularly that of enabling the new tenant to "hain" up his pastures early, which is a matter of considerable consequence; for the tenant going off at Lady-day, always stocks as hard as he can till the last moment, thereby leaving the ground as bare as possible; nor is the mischief of this late haining always compensated by the manure left from the cattle, especially if the season has been wet, and the ground tender Two years care will sometimes scarcely recover the land to a good and even turf, after having been much trodden, or "poached."

It were much to be wished, that a general rule could be adopted for the commencement and end of tenures: it would ultimately be highly advantageous to landlords and tenants, and will probably be one result of the labours of Agricultural Societies.

CHAPTER III.

SECT. I.—HOUSES OF PROPRIETORS.

THE following is a list of mansions belonging to the principal proprietors in the county:

Parish.	*Mansion.*	*Proprietor.*	
Grt.Badminton	BadmintonHouse	Duke of Beaufort	*Resides*
Stoke Giffard	Stoke House	The same	
Berkeley	Berkeley Castle	Earl of Berkeley	*Resides*
Hardwick	Court House	Earl of Hardwick	
Cirencester	Oakley House	Earl Bathurst	*Resides*
Ebrington	Ebrington Hall	Earl Fortescue	
Hawkesbury		Earl of Liverpool	
Matson	Matson House	Lord Visc. Sydney	
Henbury	King'sWestonH.	Lord de Clifford	*Resides*
Tortworth	Tortworth House	Lord Ducie	*Resides*
Woodchester	Spring Park	The same	
Weston-Sub-edge	Norton	Lord Harrowby	
Sudely	The Castle	Lord Rivers	
Grt.Barrington	Barrington Park	Lord Dynevor	
Down Ampney		Lord Eliot	
Dumbleton		Lord Somers	
Sherborne	Sherborne Lodge	Lord Sherborne	*Resides*
Newland	Highmeadow	Lord Gage	
Ashton Somerville		Lord Somerville	
Rendcomb		Dr. Barrington, Bp. of Durham*	
Elmore	Elmore Court	The same	

* In right of his wife, heiress of the late Sir William Guise, Bart.

Forthampton	Forthampton Ct.	Dr. York, Bp. of Ely	*Resides*
Stanway	Stanway House	Viscountess Hereford	
Churcham	Highnam House	Sir W. B. Guise, Bart.	
GreatWitcomb	Witcomb House	Sir W. Hickes, Bart.	*Resides*
Preston	Preston Court	Sir G.Pauncefote,Bart.	
Rodborough	Hill House	Sir G. O. Paul, Bart.	*Resides*
Flaxley	Abbey	Sir T. Crawley Boevey, Bart.	*Resides*
Westbury-on-Trim	Stoke House	Sir H.C. Lippincot, Bt.	*Resides*
Abson	Wick House	Richard Heynes, Esq.	*Resides*
Acton Iron	Court House	Walter Long, Esq.	
Addlestrop		Jas. Henry Leigh, Esq.	*Resides*
Alderley		J. Blagden Hale, Esq.	*Resides*
Avening	Gatcomb Park	Philip Sheppard, Esq.	*Resides*
Barnesley		James Musgrave, Esq.	*Resides*
Barnwood	Barnwood Court	Robert Morris, Esq.	*Resides*
Barrington Lit.		Giles Greenaway, Esq.	*Resides*
Battsford		T. Edwards Freeman, Esq.	*Resides*
Beckford		Will. Wakeman, Esq.	*Resides*
Bibury		EstcourtCresswell,Esq.	*Resides*
Bicknor English	Bicknor Court	George Wyrhale, Esq.	*Resides*
Bitton	Hanham Abbots	—— Creswicke, Esq.	*Resides*
Bitton	Highfield	Arch.Drummond,Esq.	
Bourton-on-Hill		William Bateson, Esq.	*Resides*
Bourton-on-Water		Thomas Ingram, Esq.	
Boxwell		Rev. R. Huntley	*Resides*
Broadwell		Mrs. Mary Leigh	
Buckland		Thomas Philips, Esq.	
Campden		Gerard Noel Noel,Esq.	
CharltonKing's		W. Hunt Prynne, Esq.	*Resides*
Cheltenham	Arle Court	T. Packer Butt, Esq.	*Resides*
Cirencester	Abbey	T. Masters, Esq.	*Resides*
CleeveBishop's	Southam House	T. B. de la Bere, Esq.	*Resides*
CliffordChambers		Lyster Dighton, Esq.	*Resides*

Colesbourn		John Elwes, Esq.	*Resides*
Coln St. Aldwyn		Thomas Ingram, Esq.	*Resides*
Coln St. Aldwyn	Williamstrip	M. Hickes Beach, Esq.	*Resides*
Compton Little		Michael Corgan, Esq.	*Resides*
Cowley		W. Lawrence, Esq.	*Resides*
Dean Little		Joseph Pyrke, Esq.	*Resides*
Didbrook	Wormington Grange	Samuel Gist, Esq.	*Resides*
Dimock	The Boyce	John Moggridge, Esq.	*Resides*
Doddington		Chris. Codrington, Esq.	*Resides*
Down Hatherley		John Turner, Esq.	
Dowdeswell		Edward Rogers, Esq.	*Resides*
Dyrham		W. Blathwayte, Esq.	*Resides*
Eyford		—— Dolphin,	*Resides*
Fairford		J. Raymond Barker, Esq.	*Resides*
Farmington		Edmund Waller, Esq.	*Resides*
Frampton Severn		Nath. Clifford, Esq.	*Resides*
Frampton Cotterel	Court House	Robert Tucker, Esq.	
Guiting Power	Grange	Mrs. Snell	*Resides*
Guiting Temple		Geo. Talbot, Esq.	*Resides*
Haresfield	The Moat	D. J. Niblett, Esq.	*Resides*
Hatherop		Countess of Shaftsbury, daughter of late Sir J. Webb, Bt.	
Hempstead		Rev. D. Lysons	*Resides*
Henbury	Blaise Castle	J. Scand. Harford, Esq.	*Resides*
Hill		Miss Fust	*Resides*
Horseley	Chevenage	H. Willis Stephens, Esq.	*Resides*
Horseley	Up-end-House	E. Wilbraham, Esq.	*Resides*
Horton		Thomas Brookes, Esq.	
Kemmerton		Mrs. Parsons	*Resides*
Kingscote		Robt. Kingscote, Esq.	*Resides*
Lasborough	Lasborough House	Edmund Estcourt, Esq.	*Resides*
Leckhampton		C. Brandon Trye, Esq.	
Longborough		Miss Scott	
Longford, near Glocester	Longford House	R. B. Cheston, M.D.	*Resides*
Lydney	White Cross	Rt. Hon. C. Bragge Bathurst,	*Resides*

Mangotsfield	Hill House	Isaac Elton, Esq.	
Mickleton		Walwyn Greaves, Esq.	*Resides*
Minsterworth	Highgrove	Charles Evans, Esq.	*Resides*
Miserdine		Samuel Sandys, Esq.	
Newent	Court House	James de Visme, Esq.	*Resides*
Newland	Clewerwall House	Mrs. Edwyn	*Resides*
Newland		Edmund Probyn, Esq.	*Resides*
Newnham	Hay Hill	Roynon Jones, Esq.	*Resides*
North Nibley	Nibley House	John Jortin, Esq.	
Oddington		Lady Reade	*Resides*
Olveston	Tockington House	S. Peach Peach, Esq.	*Resides*
Owlpen		Miss Daunt	
Painswick	Buenos Ayres	Benj. Hyett, Esq.	*Resides*
Painswick	Stean-bridge	Rev. R. Townsend	*Resides*
Painswick	Ebworth	Stephen Welch, Esq.	*Resides*
Pauntley	Court House	Mrs. Scudamore	
Prestbury	The Park	Hon. Berkeley Craven	
Prestbury	Hewletts	James Agg, Esq.	*Resides*
Prestbury		William Caple, Esq.	*Resides*
Preston-upon-Stour	Alscot House	James West, Esq.	*Resides*
Quedgeley	Wolstrop House	W. Hayward Winstone, Esq.	*Resides*
Saintbury	Newcomb House	Joseph Roberts, Esq.	*Resides*
Salperton		John Browne, Esq.	*Resides*
Sandhurst	Willington House	James Viney, Esq.	
Sandhurst	Wallsworth Hall	Walter Wilkins, Esq.	
Seisincote		S. P. Cockerell, Esq.	
Sevenhampton		Walter Lawrence, Esq.	*Resides*
Shipton Moigne	Estcourt	Thomas Estcourt, Esq.	*Resides*
Shurdington Little	Greenway House	Mrs. Lawrence	*Resides*
Syston		Fiennes Trotman, Esq.	*Resides*
Sodbury Little		Winchcomb H. H. Hartley, Esq.	
Stanley King's	Stanley Park	Henry Burgh, Esq.	*Resides*
Stanley St. Leonard's		John Timbrell, Esq.	*Resides*
Stanton		Rev. R. Wynniatt	*Resides*
Stapleton	Stapleton House	Isaac Elton, Esq.	*Resides*
Stapleton	Ruggeway	Arch. Drummond, Esq.	*Resides*

Stapleton	Heath House	Sir J. H. Smith, Bart.	
Stapleton		C. J. Harford, Esq.	*Resides*
Stow	Maugersbury	E. J. Chamberlayne, Esq.	*Resides*
Stowell		Richard Wilson, Esq.	
Stroud	Upper Lyppiatt	Paul Wathen, Esq.	*Resides*
Stroud	Lower Lyppiatt		
Tetbury	Highgrove	John Paul Paul, Esq.	*Resides*
Tetbury	The Grove	T. Saunders, Esq.	*Resides*
Tewkesbury	The Lodge	John Wall, Esq.	*Resides*
Thornbury	The Castle	Henry Howard, Esq.	
Todington	Todington House	C. Hanbury Tracy, Esq.	
Twining		Mrs. Maxwell	*Resides*
Upton St. Leonard's	Creed Place	Thomas Jeffries, Esq.	*Resides*
Upton	Whitley Court	Peter Snell, Esq.	
Upton	Prinknash	John Howell, Esq.	*Resides*
Westbury-on-Severn	Westbury House	M. Colchester, Esq.	
Westbury-on-Trim		Isaac Hobhouse, Esq.	*Resides*
Westbury	Sneed Park	Mrs. Jackson	*Resides*
Westbury	Redland	—— Seymour, Esq.	
Wotton near Gloucester	Wotton House	T. Westfaling, Esq.	
Yate	Stanshawes	Thomas Stokes, Esq.	*Resides*

The residence of gentlemen at their mansions is a matter of no inconsiderable importance to the welfare of the public, and, when they occupy a part of their estates with a view to its improved cultivation, highly favourable to the agricultural interests of the county. Rack-renters, however well disposed to try experiments, are usually deterred by the possibility of a failure, and, having a certain payment to make to the owner of the land, are unwilling to trust it to the uncertain issue of an untried system. No apprehension of this sort alarms a great proprietor; the subsistence of himself or family depends not on the result of an experiment, nor, if he fails in the first, is he obliged to relinquish the further pursuit of improvement, from fear of the consequence of failure. It is justly observed by Mr. Malthus, in his Treatise on Population, that the reason why the agriculture of Norway has advanced so slowly is, that there are no gentlemen farmers, who may set examples of improved cultivation, and break the routine of ignorance and prejudice in the conduct of farms, that had been handed down from father to son for successive ages.

SECT. II.—FARM HOUSES, OFFICES, AND REPAIRS.

On the Cotswolds, buildings of every description are made with free-stone, and covered with stone tiles; materials which are plentifully found on or near every estate. Lime and timber are more scarce; the scrapings of the roads, (which are calcareous stone minutely broken) are often used as a substitute for the former, and, when mixed with a small proportion of lime, form a strong cement. Timber is chiefly supplied from the Vale, though not entirely. There is nothing peculiar in the form of the houses; and, in the farm-yards, the first consideration is, to protect them from the north and easterly winds. Barns are of a moderate size, seldom exceeding 100 feet in length; the use of larger ones is, in a great degree, superseded by the modern improvement of securing the corn in stalk on staddles, and might be more so by threshing by machinery. The staddles of this county are made of upright stones with caps, placed about seven feet distance from each other, in a circular or square form. The upright stone, is a truncated pyramid, about four feet long, allowing a foot to be let into the ground; on the top (which is about four inches square) is placed the cap, which is a round stone, flat and smooth on the under side, and a little convex on the upper side; two feet in diameter, and projecting ten inches from every side of the upright stone. On these, strong timbers are framed, first extending across the circle or square, and then around; a cap and stone being always placed in the centre, to take off the bearing of the cross timbers. This plan effectually secures the corn from rats, mice, and other vermin. Where the stack happens to lean so much on either side as to require aid to prevent its falling, it is a good practice to arm the props with a sheet of tin, nailed round them, half way up, in the form of a funnel inverted; this stops vermin in their progress to the stack, and tin, on account of its polished surface, is best adapted to the purpose.

An improvement has been made, and might be introduced with great advantage, in all newly-erected barns; that of having a granary over the bay and floor for the reception of the corn after it is threshed. The additional expence is trifling in comparison of the advantages: a repository for grain is necessary on some part of the farm, and it is often attached to the dwelling-house, which has the effect of alluring vermin, to the annoyance of the family, and injury of the principal building. These evils may be prevented by consolidating the granary with the barn, which, by its insulated situation, may more easily be protected from depredations. The grain is easily taken up and let down again through a trap-door in the centre, by the same mechanical apparatus as in mill-houses, sugar manufactories, and warehouses. In the Vale, all the old buildings are of timber, with sharp pointed pediments. As these go to decay, the new erections are necessarily, and indeed more conveniently, made of brick, free-stone, blue clay-stone, or other kinds of stone, as situation and cheapness direct. No material improvement is observable in the plans; the principal attention is directed to the dairy, cheese-loft, and fatting stalls: the two first are placed as nearly as possible, to northerly aspects, for the sake of coolness; and the latter to the south and south-west, for the opposite purposes: the best plan for these last, is to form two sides of a square, with the angle to the north-east: this makes a shelter against the severity of the winds from that quarter, and opens the yard to the influence of the sun in most parts of the day. See chap. 8. sect. 4.

Thatch coverings to buildings are falling rapidly into disuse; and are succeeded by brick, or stone tiles. The former are either plain or waving (" pantiles"): both are made with knobs, by which they are fastened to the lath, but the latter have the property of securing a flatter roof than the other, and are, therefore, more often used on sheds. The stone tile is brought from various parts of the Cotswolds, (chap. 1. sect. 5.) or raised in the neighbourhood, as in the Forest and lower part of the Vale. This kind of covering requires strong timbers, and is on that account objectionable; yet, being cheaper, and more durable, is much used.

The flooring of farm-houses is usually of stone; but in places where lime is plentiful and cheap, sometimes of grip; in others of brick. The first is either free-stone, or flag-stone. Free-stone is in common use, on the hills, and near the base of them; in the neighbourhood of Dean Forest, grit-stones of a reddish or grey colour; and in the neighbourhood of Bristol they have paving stones of different colours, but one particularly of great durability and light blue cast, called Pennant-stone, or locally, Downend-stone. The grip is a composition of lime and ashes, or other materials, laid in a moist state to the thickness of four or five inches, and worked and rammed with a heavy slab of wood, till it acquires hardness and a smooth surface. This kind of flooring is durable and neat, but cannot be used to advantage, except where lime is cheap. The bricks for the third kind of flooring, are sometimes made nine inches square for the purpose.

The floors here meant, are those of kitchens, dairies, outhouses, barns, &c.; but for other rooms, as parlours, bed-rooms, &c. oak board is used on the ground, and elm on other stories, cheese-lofts, &c.

Stone and grip, though found in the flooring of many barns, cannot be recommended, on account of their bruising the grain, and particularly wheat, where oak can be procured on moderate terms.*

The best and most durable thatch, is prepared in the neighbourhood of Berkeley, and the Lower Vale. The heads or ears of the wheat-sheaves are cut off, and separately threshed; the straw, without being broken by the flail, is first cleared of weeds and short stuff, by a kind of iron-toothed comb fastened to the wall, and then being tied up into sheaves, is called "Helm". A covering of this kind, well put on, will last for thirty years, with few occasional repairs; is light, and remarkably neat.

The common thatch covering used in the neighbourhood of Gloucester, and Upper Vale, is made of the straw, threshed in the usual way, or of stubble, which is the ground stalk of the wheat left by the reaper, about a foot long, and afterwards mowed. See chap. 7. sect. 4.

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* Oak floors are said by the farmers to give the grain a smooth and shining face.

SECT. III.—COTTAGES.

Cottages are equally necessary with mansions and farm-houses, though it appears by the face of the country, that this evident truth is not always recollected. In general, through the kingdom, it is to be feared, that the popular complaint against the dilapidation of cottages is but too well founded. In the Vale, as well as other parts of this county, there are numerous instances of this mistaken policy; and under all the circumstances of the increased cost of materials, and builder's wages, it is scarcely to be supposed, that the evil, so far gone, will find a speedy remedy. Landlords generally deem building cottages an unprofitable way of expending money; yet a land owner should recollect, that he cannot expect tenants for his lands, if proper places are not provided for the residence of the labourers. A tenant, indeed, taking a farm, either not foreseeing the speedy operation of the evil, or looking up to the landlord for redress, when it shall happen, seldom, if ever, troubles himself about the number of cottages annexed to it. Overseers are not often aware of the power the law gives them of erecting cottages on the waste; and hence it follows, that more families are crowded together, than is either consistent with comfort, health, or decency; or a remedy is applied, worse possibly than the disease, which is, to build a workhouse, into which every person wanting relief is crammed, without distinction of age, sex, or cause of distress.

A cottage, which merely protects the inhabitant from the inclemency of the weather, is an incompleat provision: sound policy requires some concomitant advantages to attach him to his dwelling. I do not think that a cow is one of the necessary appendages to a cottage, or generally productive of good. In particular cases, the experiment has succeeded well, as reported by Lord Winchelsea, on his estates: and it will, perhaps, succeed in others, where the influence of a great land proprietor extends over the whole parish, or district; but property, in few instances, is thus consolidated. Besides, the management of a cow is attended with considerable trouble, requires more utensils than the earnings of a day labourer can well supply, and more conveniences of building than are usually attached to a cottage. Capital is the sinew of husbandry, and, unless it be proportioned to the undertaking, the efforts will be weak, and the success uncertain.

There is also reason to doubt, whether the labourer or his wife will be able to spare the time from their respective employments, and, should it so happen, the evil will overbalance the good. It is pleasing to see a good garden, and a pig attached to the cottage: but neither of these interfere with the daily services of the labourer, or withdraw him from the necessary attention to the business of the farmer.

The greatest of evils to agriculture would be to place the labourer in a state of independence, and thus destroy the indispensable gradations of society. The great body of mankind, being obliged to live with, and by each other, must necessarily consist of preprietors and workmen; and if it be allowed that the dependance of a regular supply of crops rests, among other things, on the regular services of the latter, it is surely an experiment not altogether without danger, to place them in such a situation as will cause them to remit a portion of their labour, at a time, perhaps, when it is most wanted.

Would you then, it may be asked by the philanthropist, confine the labourer to his situation, and prevent his rise in the scale of society? No; but I would wish it to be left to his own industry and exertion: he should be supplied with the means of doing something more than earn his daily wages; he should have more land than is usually held with cottages: the great object is to enable him to subsist without parochial relief, and this is essentially to increase his comforts. What more is done, should be the result of a conduct peculiarly frugal and industrious. I would always wish to infer from neatness in the cottage, the pig in the stye, and store of vegetables in the garden, that the occupier has neither been inattentive to his own, or the general interests of agriculture; and such a man will feel an attachment to his possessions, from the consciousness of having brought them to their present state of improvement by his own care. His desire to protect and improve his property, will also be increased by the recollection of the labour he has bestowed upon it; and when surrounded by his family, he can with truth admonish them to be attentive to their duties, in order to better their condition, not only by pointing out the evils of idleness and vice, but by shewing in his own instance the good effects of industry and prudence, cleanliness and virtue.

Influenced by these considerations, I wish that every industrious labourer possessed a legal right, under certain restrictions, to build a cottage for himself, with his own savings and the voluntary assistance of his neighbours, and to inclose a garden, of a limited extent, from the waste: or that in any way he might have a permanent security in the premises he occupies, till by idleness and vice he should become unworthy of encouragement.

It is important to determine, to what size a cottager's garden ought to be extended: the fuller discussion of this question I leave to chap. 9. sect. 1. observing only at present, that it ought not to be extended so far as to occupy too great a portion of the labourer's time: nor, however beautiful it may be in theory to raise the lower orders to a situation of comparative independence, ought the line to be faintly marked between the proprietor and labourer, as, without this distinction, neither agriculture nor commerce can flourish.

In the year 1800, some cottages were built by E. Chamberlayne, Esq. of Maugersbury, near Stow, on the plan hereunto annexed.

EXTERNAL DIMENSIONS.

Length of building	80 feet
Height of walls	16 feet

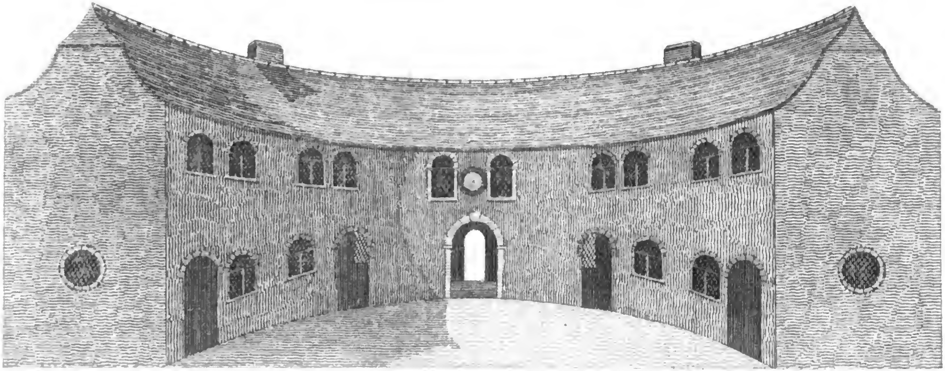
INTERNAL DIMENSIONS.

Lower room	12 feet, by 12 feet 4 inches
Pantry	5 feet by 12
Height of ditto	8 feet
Two bed-rooms	8 feet by 12 each
Height of each	8 feet

A low room, above the bed-rooms, capable of containing beds, lighted by a sky-light at the back.

to face P. 50.

Four Cottages and a School-Room, built at Maugersbury,
in Glostershire, in the Year 1800, by E. J. Chamberlayne Esq.r



The centre room, intended for a Sunday school-room, is 18 feet by 12, under which are a public oven and furnace on one side, and a coal-house opposite.

An acre of land to each garden, with a pig to the occupier. The aspect south, with a spring conveniently situated. The cottages to be let under prime cost.

On the inclosure of Eastington, in the parish of Northleach, Lord Sherborne had 20 cottages erected, and to each was assigned a garden containing a rood of land, at the yearly rent of thirty shillings.

These are laudable exertions for the comforts of a very useful class of men, who may be called the sinews of the agricultural system, and deserve every encouragement consistent with the good of the whole community.

CHAPTER IV.

SECT. I.—SIZE OF FARMS.

FARMS differ much in extent and annual value: the rent of few exceeds 1000*l.* *per annum,* or is less than 50*l.*; but the average size is from 150*l.* to 300*l.* Some large grazing farms are found in the Vale, but not frequent. A farmer often occupies 300, 400, or 500 acres, but seldom under the same landlord, or even in the same parish. This, however, in a great measure applies to the Vale and old inclosed lands. In new inclosures, it was an object of considerable consequence to place as much land as could conveniently be managed, under one tenant, to reduce the necessity of buildings. On the old farms, a superabundance of barns, stables, and outhouses, is observed; and oftentimes to as great an extent on an estate of 100*l.* a year, as under the correction of modern improvements for one of 500*l.*

This is one weighty reason in favour of large farms, against which numerous have been the complaints: the reason, however, operates chiefly on the side of the landlord, with whom the increased expence of materials and labour, in every branch of building, is an object of serious attention; and no material improvements can be made on the buildings of a farm, unless it be sufficiently large to allow considerable expenditures for the convenience of the tenant.

The supposed mischiefs likely to result to the public from large farms, are seldom made the subject of complaint till a scarcity of provisions is felt, when the real cause, arising from a failure of crops, is seldom taken to account. The high price of corn and provisions in 1800, has been satisfactorily proved to originate in a real scarcity.* Whether or not the interference of government contributed to increase the price beyond the real value, under all the circumstances of an allowed scarcity, is a question not worth the investigation, since it does not apply to the grower; who, if he did take advantage of existing circumstances, acted only upon the common principle of commerce; he only did that which every other tradesman does; he did that which is doing every day in every port, city, town, and village. If, however, by giving the alarm, the farmer was immediately induced to affix a higher value to his commodities, it certainly had a tendency to diminish the consumption, and encourage importation; by which means the scantiness of the crops was relieved, and a total want prevented.

The great farmer is charged with being able, by the extent of his capital, to watch the fluctuation of the markets, and bring forward his stores as he finds they may be disposed of to the greatest advantage. The capital of every agriculturist must be adequate to the extent of his undertaking; yet it must also be remembered, that his daily expences bear a proportionate ratio; returns must be made at regular periods, to pay the labourer, tradesman, tax-gatherer, tytheman, and landlord. To this general necessity, the exceptions are few; not enough to justify the clamour raised against the occupiers of large farms.

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* Among the ordinary causes of the increased price of corn, may be reckoned, the rise of rent, the consumption of grain in fattening cattle, breweries, distilleries, manufactories of starch and hair-powder; and, perhaps more than all, increased population.

In forming a judgment on questions of great political importance, we are not to conclude from particular instances.—In all societies of men, in all branches of employment, some will be found of a cast peculiarly rapacious: the spirit of monopoly always has been, and ever will exist in commercial transactions, in proportion to the means of carrying it into effect; and the reason why it passes without imputation of offence, in one case, while in another it is loaded with imprecations, is because, in the latter, the necessaries of life are concerned; in the former, its luxuries, or at most its conveniences: yet, in all, it may be traced to the same principle, and justified by the same rules of reasoning.

In the corn, as in other trades, the middle man stands between the grower and consumer; prompted by his interest, and assisted by a large capital, or, what is equal to it, an assured credit, he is enabled to accumulate the stocks of the smaller growers, to keep up a limited supply, and check an overflow in the market. The large renter, with a proportionate capital, is not under the necessity of throwing himself into the hands of the factor, but is, in fact, a bar to the completion of his views. Large farms, indeed, in the occupation of wealthy renters, are a species of magazines or repositories kept for the use of the public, but without those mischiefs which would attend them if they were a public concern.

In a year of scarcity, the interest of the public and the grower, is the same; and it is this, that the crop, whatever it may be, together with the stock in hand,

and the stock imported, should be brought to market and distributed as equally through the year as possible; by which the farmer gets a price in proportion to the supply, and the public have it as cheap as it can be afforded. This is, therefore, the aim of the farmer for his own sake; and whatever deficiency is felt, must be made up by economy and substitutes. The views and interest of the factor are different; in buying, he does not mean to accommodate the public, but, for the sake of an extraordinary price, to prevent a regular supply of the market. Indeed, whenever there is a failure of crops, the increase of price will soon ascertain it, and also prove a better expedient, than any which the sagacity of the politician can discover, to prevent an absolute want; since the consumer will feel the necessity of limiting his allowance, on principles of domestic economy, and thus, almost without knowing that he is really acting on system, will be highly instrumental in apportioning the scanty produce of the year to the year's consumption.

It would be a ruinous circumstance for this, or any other country, if the whole crops of the year were brought into the market *within* the year: the uncertainty of seasons, and various unforeseen accidents, require a stock in hand; and where can this stock be so conveniently stored as in the farmer's rick-yard? It seems to be generaly admitted, that the art of man hath not yet discovered any mode of preserving corn, equal to that in an unthreshed state. It is objected, that from the great extent of land under the management of a large farm, it is almost impossible that it can be attended with equal care, and therefore not equally productive. But this observation is not supported by experience: on soils of equal goodness and proportionate capitals, it is probable that the cultivation will be equally good. The means of improvement are certainly within reach of the great farmer: his capital enables him to purchase a large and choice stock of cattle; hence, breeds are improved, and manure provided: he can also purchase the expensive machinery of modern invention; hence, more work is performed: and it is a consideration of no small importance, that, should he be stimulated to try an experiment, and fail in it, the loss does not materially affect him; whereas, a little farmer is obliged to tread implicitly in the steps of those who have gone before him, and must rest satisfied with a small, but certain return, rather than risque the uncertainty of experiment, from which a loss might be sustained, without the adequate means of supporting it.

While, however, it is thus attempted to abate, in some measure, the odium which has been affixed to the renters of large estates, it is not intended to support the opinion, that it would be for the general good, if it were practicable, that there should be no small farms: for, as in trade, so in agriculture, the extent of the business must be measured by the capital; and, however ready the small farmer, who is now among the complainers, would be to increase his occupation, if his means were adequate, yet he is for the present kept down to a more circumscribed estate by the unavoidable necessity of his lot: but as, in this case, it would be hard for him not to have an opportunity of exerting his industry to the extent of his abilities, so it would be equally hard, that another, who had spent the early part of his life in the pursuit of agricultural knowledge, and acquired it at considerable expence, should at length be obliged to withdraw his capital from the only mode of employment, in which he can expect a liberal return for the pains he has taken.

If the enquiry be directed to the interest of the occupier only, as to the quantity of land he ought to rent, it may be observed, that a farm should not be less than sufficient for a plough; what that is, will depend upon the nature of the soil, the mode of cultivation, and other circumstances. Where a full team is kept, (and the business cannot be well managed without it,) and there is not enough to employ it, an evident loss accrues to the occupier; on the contrary, if the farm be too much for one, and not sufficient for two teams, the loss is equally certain; for, in the attempt to manage an excess of land with unequal strength and powers, the business will be done slightly or slovenly, and consequently the return will be small, and the increase of filth and weeds abundant.

After all, whether large or small farms are more or less beneficial to the public, as well as to the individuals who occupy them, depends very much on local circumstances. Soil, situation, and mode of cultivation, are all material ones. I have hitherto reasoned upon the supposition, that the small farmer is deficient in capital, and cramped in his exertions. In situations, however, where capital abounds, and is found in the hands of numerous persons within reach of great towns, where markets are good, labour and manure to be purchased, small farms are probably most beneficial to the public, and individuals; because, although employed principally in raising corn, they are capable of being cultivated like gardens, and the produce will be greater in proportion. It is difficult, indeed, to say to what extent the employment of capital to advantage upon land may be carried; at least, it has never yet been proved.

We seldom hear of a farmer being injured by the employment of too large a capital on a small farm, but every day gives instances of ruin being the consequence of a want of sufficient capital; and the greatest error farmers generally commit, is taking too much land, according to their means of cultivating and improving it. In hiring a farm, a man should first estimate the amount of the capital he can command; then calculate how many acres that will put into a good state of cultivation; and then have resolution to limit his views to a farm of that extent. By this conduct, he will be happy, rich, and respectable; by a contrary one, wretched, poor, and despised.

SECT. II.—RENTS.

The rents in this county are universally paid in money, and, in point of value, vary with the nature of the soil, situation, convenience, and other circumstances. In the neighbourhood of the cities, and other market towns, detached parcels of pasture ground are rented as high as from 5*l.* to 8*l.* per acre, and arable from 2*l.* to 3*l.* This is the consequence of accommodation and necessity, and has nothing to do with the agricultural system; but even in the interior parts of the county, a considerable rise has been experienced within the last twenty years, and particularly in the ensuing year to that, when corn bore such an extraordinary price. The policy of this last measure is, however, questionable; and the event will probably shew, that it was equally unwise in the landlord to take advantage of a circumstance, which could only be temporary, and in the tenant, to take a lease of an estate at a rent so considerably improved, in the prospect of being able at all future times to sell his crops at a rate equally exorbitant.

The average rents are nearly as follow:

	Arable.		Pasture.	
On the Cotswolds······	15s.	—	25s.	per acre
In the Vale············	20s.	—	30s.	per acre
In the Forest district····	20s.	—	25s.	per acre

The rental of the county, as calculated from the parochial returns in 1803, is 846,234*l.* If the parishes are in general rated at three-fourths of the rack-rent, and the other fourth be added, the sum will be, 1,128,312*l.*; which probably is not far from the truth, including the rent of buildings of all kinds in the city, market-towns, and villages.

SECT. III.—TYTHES.

Within the last century, more than ninety Acts of Parliament have been passed for the inclosure of waste and commonable lands, in this county; by which a considerable part has been exonerated from tythes, besides demesne lands, glebe, and others, which have been discharged by private agreement between the impropriator, and land-owner, or under the Act for the Redemption of the Land-tax. See chap. 15. sect. 8.

In the inclosing of waste, where it has been a part of the plan to exonerate from tythes, a portion of land has been allotted to the tythe-owner, and the same in common fields and old pasture, where practicable: where it has not, owing to the smallness of the properties, or other reasons, corn-rents have been fixed, liable to an alteration of increase or decrease, on an average price of corn for the preceding seven or fourteen years. The general rule laid down and pursued by the commissioners, has been, to give a fifth of arable, and a ninth of pasture, by way of compensation; without any expence to the late owner of the tythes, either towards the charges of the act, inclosing, planting with quicksets, walling, or other modes of ring fencing, and keeping the fences in repair for the seven following years.

The loss of a tenth part of the improved produce of land, has long been considered as a grievance, and, it must be allowed, not altogether without reason; but that it has operated as a check to agricultural improvements, to such an extent as some writers have endeavoured to carry it, cannot be conceded. In this county, a solitary instance may possibly be produced, where a small quantity of land has been suffered to lie in a neglected state, to defeat the demands of the tythe-owner; but this is a trifling loss in the superficies of a county, and cannot have a sensible influence on the total produce. It is not, indeed, at all probable, that many farmers will voluntarily submit to the loss of nine parts, as this is a proceeding altogether inconsistent with the views of the tenantry; and, under such circumstances, how is the rent to be made up? It is possible also, that a peculiarly exorbitant demand for composition, or oppressive mode of collecting the corn-tythes in some districts, may have the temporary effect of converting tillage to pasture; but this cannot last long. The grazier must have straw for fodder, and corn for his family; the former he will purchase with difficulty, and the latter with unwillingness. The crops which will make the best return from the market, and are also most congenial to the soil, will generally be preferred. Besides, if the laying down of lands to pasture were an evil to be apprehended, the usual covenant of leases in the Vale is unnecessary; but the real fear is, that the tenant will, under all disadvantages, break up and convert to tillage, unless prevented by adequate penalties and restrictions.

In the case of conversion of waste lands to tillage, it certainly bears hard upon the farmer, to have the tenth of his produce taken by the tythe-man, or even to pay the regular composition; because the expences of breaking up and bringing a quantity of land, uneven in its surface, and probably overgrown with heath and furze, to a productive state of tillage, far exceed the usual costs and labour of cultivation. In general, the objection is removed, by the allotment of a portion of the waste to be inclosed, in lieu of tythes; but when this is not done, it is equitable, either that the composition should be fixed at a low rate, or that the claim be entirely given up for a limited time. On the inclosure of Iron Acton Common, the newly converted land was exempted for seven years, in consideration of its being covered with furze, and therefore broke up with great trouble and expence.

In this county, the instances of tythe being taken in kind, are not numerous; at least among the clergy; and compositions are moderate. In few cases, does the demand exceed 6*s*. or 7*s*. per acre, for the produce of arable land; or half-a-crown in the pound, on the rack-rent, of pasture and meadow. Such a demand cannot be deemed inequitable; and it is a justice due to the occupiers to observe, that it is generally submitted to without reluctance.

Where, however, the tythes are taken in kind, a different conduct often prevails: though the lands are continued in the usual course of cultivation, yet unkind feelings are excited on both sides, and all advantages, honourable or otherwise, are taken. A scrupulous exactness, in demanding the utmost which the law allows, and all the jealousy of suspicion, are found on one side; and, on the other, every obstacle, arising from subterfuge, equivocation, and chagrin. Hence, mutual animosities, kept up by repeated irritation, law-suits and enormous expences, which sometimes terminate in ruin. To this may be added, a defeat of the very end of the original establishment, by a dereliction of religious duties on the part of the occupier, and at best a languid and unsatisfactory performance of them on the part of the clergyman. These are evils of sufficient magnitude, even without throwing in the weight of agricultural interests, to induce every well-wisher to the promotion of religion and social comfort, to look forward with hope of the entire adoption of a plan favourable to peace, and satisfactory to the claims of both parties.

That a plan, indeed, embracing so many interests and views, can be proposed, free from objection, is hardly to be expected. To make the commutation in land entirely, is impracticable in many old inclosed parishes; nor is it to be desired. There are some serious objections to the accumulation of this species of property in the Church, which have been sufficiently explained by writers on the subject: nor ought it to consist entirely of money payments: might not both be blended in such a manner as to secure the interests and conveniences of all? To every benefice, let a sufficient portion of land be allotted, where practicable, near the house, to enable the owner to provide some necessary articles for the consumption of the family, without being obliged to have recourse to a distant market: this, however, should not be large enough to constitute a farm, in the strict sense of the word, so as to be the occasion of engaging the occupier too deeply in the business of the world. To ascertain the exact extent of such a glebe, is difficult, as depending on relative circumstances; but it should in some measure depend on the value of the living; and a maximum, or minimum, might be determined at first setting out, above or below which it should not extend. Some benefices are already so well supplied with glebe, as to require no addition; and these might afford certain points, on which calculations might be made for others.

Money payments can be settled no other way than as corn-rents, secured on the produce of the lands: an investiture in the public funds is liable to serious objections. The rents should vary with the price of corn; and this might be ascertained by a reference to the sessions records, as is usual under private acts. The only alteration I would wish to suggest, is, to leave the choice of that reference to three years, instead of seven or fourteen, with either party. Fourteen, or even seven years, include a considerable portion of an incumbent's life; and by looking back on what has passed within the last five years, the disproportion of any corn-rent which might have been fixed ten years before, is obvious. The income of a clergyman should receive an increase proportioned, as nearly as possible, to the advance of prices, since he must feel the inconvenience arising from it; and the same will hold good, in an inverse ratio, on a decrease. The equity of this plan is felt by the occupier also. Supposing, that during the preceding term, corn should have arisen to an extraordinary price, and the corn-rent be fixed accordingly for the next period; from that average, the occupier will pay an unreasonable composition for his tythes, greater perhaps, and more oppressive, than he would have experienced under the ancient system.

SECT. IV.—POOR RATES.

The annual cost of maintaing the poor, appears, from the parochial returns before-mentioned, to be higher than might reasonably have been expected; though, when it is recollected that the calculations almost immediately follow two severe and scanty years, considerable deductions must be made, before any right conclusions can be formed. Besides, the great and expensive burden which has been thrown on parishes for the supply of the army, has necessarily tended to increase the parochial assessments. On this account, it might perhaps have been better to have delayed the enquiry, till, by the termination of the war, and the restoration of plenty, the expenditures had been brought back to their accustomed level, or at least a fair average might have been taken.

Among the many plans proposed with a view of reducing the poor rates, none seem more likely to answer the purpose in the country, than supplying cottagers with land, and assisting them with the means of raising potatoes, &c. for their families. In the upper part of the Cotswolds, the farmers allow small portions in the corners of their fields to the cottagers; and in the Vale, it would be advantageous to allot some acres lying in fallow for wheat, in proportion to the number in family, stipulating, that they should, in prospect of this indulgence, collect what manure they could, for the use of the land. Sir John Methuen Poore, Bart. has tried the experiment, with a result perfectly satisfactory. He allots four acres to thirty cottages, containing 131 inhabitants. This would seem a scanty allowance, being little more than twenty perch to each family, unless it be in addition to a garden of more than equal quantity.

Allotments also, at a moderate rent, are much recommended, and in some instances have been proved to answer the purpose. As to the size of such allotments, and the most useful application of them, opinions differ. Thomas Estcourt, Esq. who has paid much attention to the subject, and made experiments upon it, strongly inclines to think, that a larger allowance of land than what is usually in the occupation of agricultural labourers, will ameliorate their condition, and relieve the public burden. "If a cottager occupies an acre of land, so situated as that the plough may be admitted to the cultivation of it, and he can prevail on his master to lend the use of his team to plough the land, and cart out the manure, the whole of the rest of the work may be done by the family, without the labourer's losing an hour's time on it." This opinion is founded on the experience of several instances, in which it has been performed; and particularly in three, where widows, with each a large family, have maintained them by their labour. "One of these, (with one acre of land and six children,) whose husband has been dead three years, considers herself better able to maintain her family now than when he was living, as he spent much of his money at the alehouse."

These are strong cases, and, if they were capable of general application, might materially aid the reduction of the poor rates; but great difficulties seem to attend the plan on an extended scale. See chap. 9.

It appears, that, in this county, 33,113 persons are relieved in and out of workhouses, at the expence of 3*l*. 1*s*. 7½*d*. per head, or 102,013*l*. 12*s*. 8*d*. total; which, taking the rental at 1,128,312*l*. gives about 1*s*. 9½*d*. in the pound *per annum*. See chap. 15. sect. 8. and Appendix.

SECT. V.—LEASES.

It is the practice of the county to let on leases, which are varied according to the will of the landlord, but usually adapted to the custom of the neighbourhood. Long leases, for twenty-one years, except under lords of the manor, or corporate bodies, and renewable, are now pretty much out of use: A three-year's taking, is not uncommon; seven years most frequent, and fourteen most rare, in the Vale at least, except under peculiar circumstances. Where the arable lands are fallowed once in three years, the first mode is generally adopted; on grazing farms, the second; and the latter on the large Cotswold farms, as suiting the rotation of crops, and the seven year's system. In those parts of the Vale where the fallow-year comes round every fourth, the usual term is four, eight, or twelve. In fact, the terms of leases are adapted to the agricultural arrangements of the respective parishes in which they are granted. The covenants are generally the same as in other counties; on the old pastures, however, the tenant is universally restrained from breaking up, and almost as generally from selling hay or straw, without bringing a proportionate quantity of dung in lieu of it.

SECT. VI.—EXPENCE AND PROFITS.

The expenditures and profits of a farm, depend so much on the industry, attention, and activity of the occupier, that it is difficult, from the calculations of one, to form an estimate of all. The difference which a few years have made, both in the appearance and mode of living among the yeomanry, has generated an opinion, that the profits of farming are very high. In whatever degree this opinion may be just with regard to the great renters, it certainly does not hold good among the small ones: they still, in a great measure, keep up the old appearance, live frugally, spend little, and seldom die in the possession of much property. Hence, it would seem, that the actual profits of agriculture are not considerably increased: where, however, a strong capital is employed on a large farm, the several small profits which would arise from divided parts of it, in the aggregate, make a considerable sum; and, surely, if a man brought up in the agricultural line, is possessed of more money than his neighbours, he is equally entitled to an increased return from it, with others, who, by employing a less capital in trade, make a more splendid appearance, and perhaps a greater interest. If the departure from the ancient character of a farmer, in dress and living, has, in some instances produced in the landlord a determination of raising his rents, the effect is felt by the occupier, and does not, I conceive, extend to the community. The little farmer, though he preserves the exterior of ancient manners, feels no relief from high rents on that account; but if there be a difference, he holds his estate at a higher proportionable rent than the other; and this, for the obvious reason, that his farm, being within the reach of many, excites a greater degree of competition, and is therefore often rented at a higher price, than is compatible with the reasonable profits of the cultivator.

To make a calculation of the aggregate expences and profits of a farm, is a matter of considerable difficulty; and, to do it with accuracy, the information should come from the farmer himself, which cannot reasonably be expected. The following calculations are made from the ascertained prices of labour by hire, &c.; but many expences are incurred, losses sustained, and smaller profits made, which cannot be brought into the account.

Calculation of an arable farm in the Vale, of sixty acres, two crops and fallow, begining at Lady-day.

No. 1.—*First year. Fallow.*

DEBTOR.	£.	s.	d.
Three ploughings, at 15*s.* per acre - -	135	0	0
Carting manure - - - - - -	10	0	0
Ploughing and sowing, at 8*s.* - - -	24	0	0
Seed, two bushels and a half per acre, at 8*s.*	60	0	0
Taxes, at 3*s.* per acre - - - - -	9	0	0
Interest of capital, wear and tear of implements - - - - - - -	20	0	0
No. 2.—*Second year. Wheat.*			
Hoeing, at 7*s.* 6*d.* per acre - - - -	22	10	0
Reaping, at 8*s.* per acre - - - - -	24	0	0
Carrying and ricking - - - -	15	0	0
Threshing, at 2*s.* 6*d.* per quarter - - -	18	15	0
Delivering at market - - - -	15	15	0
Tythes, at 6*s.* per acre - - - -	18	0	0

	£.	s.	d.
Taxes - - - - - - - - -	9	0	0
Rent of two years - - - - -	120	0	0
Interest, &c. - - - - - - -	20	0	0
	521	0	0

CREDITOR.

Crop, 150 quarters, or 20 bushels per acre, sold at 8s. per bushel	£.480	0	0			
Loss - - - - - -	41	0	0			
				521	0	0

No. 3.—*Third year. Beans.*

DEBTOR.

Ploughing once - - - - - - - - -	45	0	0
Setting, at 1*s.* 4*d.* per bushel - - - - -	10	0	0
Seed, 150 bushels, at 5*s.* - - - - -	37	10	0
Bush harrowing - - - - - - -	7	10	0
Hoeing, at 6*s.* per acre - - - - -	18	0	0
Cutting, at 7*s.* per acre - - - - -	21	0	0
Carrying and ricking - - - - - -	15	0	0
Threshing, at 1*s.* 4*d.* per quarter - - - -	12	10	0
Delivering - - - - - - - -	15	15	0
Tythes, at 6*s.* per acre - - - - -	18	0	0
Taxes - - - - - - - - -	9	0	0
Rent - - - - - - - - -	60	0	0
Interest, &c. - - - - - - - -	20	0	0
Profit - - - - - - - - -	160	15	0
	450	0	0

CREDITOR.

Crop, at 30 bushels per acre, and sold at 5*s.* per bushel ··	£.450	0	0			
				450	0	0

No. 4.—*Three crops and fallow. First and second year, fallow and barley.*

DEBTOR.

	£.	s.	d.
Ploughing and manure, as in No. 1. - -	169	0	0
Seed, 210 bushels, at 4s. - - - -	42	0	0
Harrowing, and rolling or beating - -	4	0	0
Mowing, at 2s. per acre - - -	6	0	0
Harvesting - - - - - -	6	0	0
Carrying and ricking - - - -	15	0	0
Threshing, 2s. per quarter - - - -	22	10	0
Delivering - - - - - -	15	15	0
Rent, two years - - - - - -	120	0	0
Taxes - - - - - - -	18	0	0
Tythes, at 6s. per acre - - - -	18	0	0
Interest, &c. - - - - - -	40	0	0
	476	5	0

CREDITOR.

	£.	s.	d.	£.	s.	d.
Crop, at 30 bushels per acre, sold at 4s. per bushel - - -	£.360	0	0			
Loss - - - - - -	116	5	0			
				476	5	0

No. 5.—*Third year. Beans.*

DEBTOR.

	£.	s.	d.
Expences, as before - - - - -	289	5	0
Profit - - - - - - -	160	15	0
	450	0	0

CREDITOR.

	£.	s.	d.
Crop, as before - - - - - -	450	0	0

No. 6.—*Fourth year. Wheat.*

DEBTOR.	£.	s.	d.
Ploughing once and sowing - - - -	60	0	0
Seed, hoeing, reaping, carrying, threshing, delivering, tythes, &c. - - - - -	263	0	0
Profit - - - - - - - -	157	0	0
	480	0	0

CREDITOR.			
Crop, as before - - - - -	480	0	0

COMPARATIVE VIEW.

TWO CROPS AND FALLOW.			
First and second year.····Loss - -	41	0	0
Third year ···············Profit - -	160	15	0
Profit	119	15	0

THREE CROPS AND FALLOW.			
First and second year····Loss - -	116	5	0
Third and fourth year····Profit - -	317	15	0
	201	10	0
	119	15	0
Difference in favour of 3 crops and fallow	81	15	0

No. 7.—*Eight crops and fallow. First year, fallow; second, wheat.*

DEBTOR.			
Expences, as in No. 1 and 2. - - - -	521	0	0

CREDITOR.			
Crop, ditto - - - - - - -	480	0	0

No. 8.—*Third year. Beans.*

DEBTOR.

	£.	s.	d.
Expences, as in No. 3. - - - - -	289	5	0

CREDITOR.

Crop - - - - - - - -	450	0	0

No. 9.—*Fourth year. Barley.*

DEBTOR.

Paring and burning, at 10*s.* per acre -	30	0	0
Ploughing once, at 15*s.* - - - - -	45	0	0
Seed, as in No. 4, sowing, harrowing, &c.	46	0	0
Mowing, &c. - - - - - -	64	0	0
Rent and taxes, &c. - - - -	107	0	0
	292	0	0

CREDITOR.

Crop - - - - - - - -	360	0	0

No. 10.—*Fifth year. Clover.*

DEBTOR.

Seeds sown with the barley, clover 600*lb.* at 6*d.* per pound - - - -	15	0	0
Ray-grass, 30 bushels - - - -	9	0	0
Hop clover, 300*lb.* at 7*d.* - - -	8	15	0
Mowing, at 2*s.* 6*d.* per acre - - -	7	10	0
Harvesting, at 6*s.* per acre - - -	18	0	0
Carrying and ricking - - - -	9	0	0
Delivering - - - - - - -	31	0	0
Rent - - - - - - - -	60	0	0
Taxes - - - - - - - -	12	0	0
Tythe, at 2*s.* 6*d.* per acre - - - -	7	10	0

	£.	s.	d.
Interest on capital	15	0	0
Wear and tear	5	0	0
	197	15	0

CREDITOR.

Crop, 90 tons, at 3*l.* 10s.	£.315	0	0			
After eatage, at 10s. 6*d.*	31	10	0			
				346	10	0

No. 11.—*Sixth year. Clover fed.*

DEBTOR.

Rent	60	0	0
Tythes and taxes	19	10	0
Interest on capital, &c.	20	0	0
	99	10	0

CREDITOR.

Crop, 90 tons, or 3*l.* per acre profit	180	0	0

No. 12.—*Seventh year. Potatoes.*

DEBTOR.

Manure and carting	6	0	0
Ploughing once	45	0	0
Seed, 540 sacks, at 6*s.* per sack	162	0	0
Cutting and planting	9	0	0
Hoeing and weeding, at 8*s.* per acre	24	0	0
Ploughing out and picking, at 17*s.* per acre	51	0	0
Rent, tythe, and taxes	87	0	0
Interest on capital	20	0	0
Delivering at market	180	0	0
	584	0	0

CREDITOR.				£.	s.	d.
Crop, 60 sacks marketable potatoes, at 6*s*. per sack on an acre, or in the whole 3600 sacks - - -	£.1080	0	0			
Trash, 600 sacks, at 2*s*. 6*d*. per sack - - - -	75	0	0			
				1155	0	0

No. 13.—*Eighth crop. Wheat.*

DEBTOR.	£.	s.	d.
Ploughing once, and sowing, &c. as in No. 6 - - - - - - - -	323	0	0

CREDITOR.	£.	s.	d.
Crop, as in No. 6 - - - - - -	480	0	0

No. 14.—*Ninth crop. Beans.*

DEBTOR.	£.	s.	d.
Expences, as in No. 5 - - -	289	0	0

CREDITOR.	£.	s.	d.
Crop, as in No. 5 - - - - -	450	0	0

RECAPITULATION.

	DEBTOR.				CREDITOR.		
	£.	s.	d.		£.	s.	d.
First and second year - -	5[illegible]1	0	0	—	480	0	0
Third year - - -	289	5	0	—	450	0	0
Fourth year - - -	292	0	0	—	360	0	0
Fifth year - - -	197	15	0	—	346	10	0
Sixth year - - -	99	10	0	—	180	0	0

	£.	s.	d.		£.	s.	d.
Seventh year - - -	584	0	0	—	1155	0	0
Eighth year - - - -	323	0	0	—	480	0	0
Ninth year - - -	289	0	0	—	450	0	0
	2595	10	0	—	3901	10	0

Hence it appears, that the total profit of nine years on this system is 1306*l.* or 145*l.* 2*s.* 2½*d. per annum;* whereas, on two crops and fallow, it is 119*l.* 15*s.* for three years, or 39*l.* 18*s.* 4*d. per annum;* and, on three crops and fallow, 201*l.* 10*s.* or 50*l.* 7*s.* 6*d. per annum;* in the first case 105*l.* 3*s.* 10½*d.* less, and in the second, 94*l.* 14*s.* 8½*d.*

Arable farm, of 60 acres, on the Cotswolds, converted from down or saintfoin, commencing Lady-day.

No. 15.—*First year. Turnips.*

DEBTOR.

	£.	s.	d.
Breast ploughing and burning, at 20*s.* per acre - - - - - - -	60	0	0
Ploughing once, at 10*s.* - - -	30	0	0
Sowing and harrowing - - - -	12	0	0
Seed, 90*lb.* at 1*s.* per. *lb.* - - -	4	10	0
Hoeing, at 7*s.* per acre - - - -	21	0	0
Expences in moving hurdles, &c. while eating off - - - - -	12	0	0
Rent, at 15*s.* per acre - - - -	45	0	0
Tythes, at 3*s*, - - - - -	9	0	0
Taxes, at 3*s.* - - - - - -	9	0	0
Interest of capital - - - -	15	0	0
Wear and tear - - - - -	5	0	0
	222	10	0

CREDITOR.

	£.	s.	d.
Value of crop, as by the following calculation: 20 sheep will eat, besides hay, 400*lb.* of turnips per day: a good acre will produce 15 tons, or 33,600*lb.* which will therefore serve 20 sheep for 12 weeks: the keep of each sheep, valued at 6*d.* per week, produces in 12 weeks 6*l.* for the whole per acre, or 360*l.* for 60 acres: but 2*l.* 10*s.* at least, must be deducted from the profit of each acre, for a ton of hay, or 150*l.* upon the whole, which reduces the sum to	210	0	0

No. 16.—*Second year. Barley.*

DEBTOR.

	£.	s.	d.
Ploughing once	30	0	0
Sowing and harrowing	12	0	0
Seed, 210 bushels at 4*s.*	42	0	0
Rolling, at 2*s.* per acre	6	0	0
Weeding thistles, &c. at 2*s.*	6	0	0
Mowing, at 2*s.* per acre	6	0	0
Harvesting, ditto	6	0	0
Carrying and ricking	15	0	0
Delivering	10	0	0
Threshing, at 2*s.* per quarter	15	0	0
Rent and Taxes	54	0	0
Tythes, at 4*s.* per acre	12	0	0
Interest of capital, &c.	20	0	0
	234	0	0

CREDITOR.

	£.	s.	d.
Crop, at 25 bushels per acre	300	0	0

No. 17.—*Third year. Seeds (sown last year with the barley,) now cut for hay.*

DEBTOR.	£.	s.	d.
Ray grass, 120 bushels	36	0	0
Honeysuckle, 240*lb.*	12	0	0
Broad clover, 720*lb.*	18	0	0
Milled hop, 300*lb.*	8	5	0
Mowing and harvesting, at 7*s.* per acre	21	0	0
Tythe, at 2*s.* 6*d.*	7	10	0
Rent and Taxes	54	0	0
Interest of capital, &c.	20	0	0
	176	15	0

CREDITOR.	£.	s.	d.
Produce, 90 ton, at 3*l.* per ton	270	0	0

No. 18.—*Fourth year. Fed off.*

DEBTOR.	£.	s.	d.
Rent, tythe, taxes, and interest of capital as in No. 17.	81	10	0

CREDITOR.	£.	s.	d.
Return, at 2*l.* per acre	120	0	0

No. 19.—*Fifth year. Wheat.*

DEBTOR.	£.	s.	d.
Ploughing once	30	0	0
Sowing and harrowing	12	0	0
Seed, at 8*s.* per bushel	60	0	0
Hoeing, at 4*s.* per acre	12	0	0
Reaping, at 6*s.* 6*d.* per acre	19	10	0
Carrying and ricking	10	0	0
Threshing, at 3*s.* per quarter	16	17	6
Delivering	5	12	0
Rent and taxes	54	0	0

	£.	s.	d.
Tythes, at 6s. per acre	18	0	0
Interest of capital, &c.	20	0	0
	257	19	6

CREDITOR.

Produce, 112 quarters and a half, at 3*l.* 4*s.* per quarter	360	0	0

No. 20.—*Sixth year. Oats.*

DEBTOR.

Ploughing once, sowing & harrowing in seed	42	0	0
Seed, 300 bushel, at 3*s.* per bushel	45	0	0
Mowing, harvesting, carrying, and ricking	27	0	0
Threshing, at 1*s.* 3*d.* per quarter	11	5	0
Rent	45	0	0
Tythe, at 3*s.* per acre	9	0	0
Taxes	9	0	0
Delivering	5	12	0
Interest of capital, &c.	20	0	0
	213	17	0

CREDITOR.

Produce, three quarters per acre, at 1*l.* 4*s.* per quarter	216	0	0

RECAPITULATION.

DEBTOR.	£.	s.	d.	CREDITOR.	£.	s.	d.
First year, expences	222	10	0	Expenditure of crop	210	0	0
Second ditto	234	0	0	Produce	300	0	0
Third ditto	176	15	0	Ditto	270	0	0
Fourth ditto	81	10	0	Ditto	120	0	0
Fifth ditto	257	19	6	Ditto	360	0	0
Sixth ditto	213	17	0	Ditto	216	0	0
	1186	11	6		1476	0	0

Total Creditor	£.1476	0	0
Total Debtor	1186	11	6
	289	8	6—or £.48 4 9 *per ann.*

The expences here charged to the farmer for ploughing and harrowing, are according to the usual rate of hire; but as his team may sometimes be bringing in money for work done for others, the actual expences will be considerably lower than here stated.

In the Vale, on two crops and fallow, a team of four horses will be nearly employed as follows:

On the fallow year, three ploughings to twenty acres, one for wheat sowing and one for beans, making in the whole the same as ploughing one hundred acres. This will employ one hundred and thirty days at least, besides harrowing, which may be estimated at fifteen more. Fifteen days more will probably be employed in carrying the corn home, and as many more to market. Six days statute duty upon the roads. Fifteen days for fetching coal or other fuel. Twenty days at the dung cart, and fifteen for unforeseen operations of the farm. The account will then stand thus—

Ploughing - - -	130 days
Harrowing, &c. - - -	15
Carrying corn - - -	15
Carrying to market - - -	15
Statute duty - - -	6
Fetching coal, &c. - - -	15
Carrying dung - - -	20
Sundries - - - -	15
	231

Which, deducted from 313 working days, leaves 82 days, a great part of which, may, in almost all situations, be employed for hire; making, however, all due allowances for hindrances by weather, &c. a drawback of 40*l.* at least may be made on the expences of maintaining a team of four horses, which I state at 106*l.* 12*s.* a year.

	£.	*s.*	*d.*
Four horses at 4*s.* per week for 52 weeks -	41	12	0
Carter and boy - - - - - -	50	0	0
Tax, shoeing, &c. - - - - -	15	0	0
	106	12	0
Deduct profit of hire - - - -	40	0	0
	66	12	0

66*l.* 12*s.* divided by 100, gives something more than 13*s.* per acre.

In the foregoing calculations, the whole land is supposed to be employed on one kind of crop; which in fact is not the case, though the result is the same whether, for instance, in two crops and fallow, the crop of wheat and beans be estimated as growing on the whole in each of two years, or whether twenty acres be in wheat, twenty in beans, and twenty fallow, in each of the three years; because sixty acres of each are grown, and sixty acres are unproductive in the fallow year.

CHAPTER V.

IMPLEMENTS OF HUSBANDRY.

WAGGONS used in husbandry are chiefly with narrow wheels, drawn by four or five horses, and carrying from two to three tons. They are either full bedded, or with three quarter beds: the former have the advantage of a greater length of bed, but are not so convenient for turning; the latter, though diminished in size, has the convenience of locking the fore wheels, and turning in almost as narrow a compass as a chaise, in consequence of the bed being hollowed out on each side, near the middle, to admit the exterior part, or felloes of the fore wheels. Both waggons are capable of carrying nearly the same weight, though the former, being deeper in the bed, is somewhat better adapted for the carriage of heavy articles, such as bags of corn, &c. For the purposes of harvesting, or carrying hay and straw, their length and width are increased by light "ladders" before and behind, and a similar contrivance of "rathes" the whole length of the sides. The ladders are put on and taken off at pleasure, in both kinds; but the side additions are generally fixed, except in the strait bedded, which are in use on the western side of the Severn; in these they are made removeable, so as to leave the bed quite naked.

Carts are usually made with six inch wheels, or more, to go on the lands. There is nothing particular in their form, or new in the improvement of them, except it be the mode of adapting them on small farms to the purpose of harvesting, by the occasional addition of ladders and rathes. In the lower part of the Vale, they are called dung-pots; and, in the Forest district, when drawn by oxen, wains.

The dray is a very useful carriage on pasture grounds, particularly for carrying thorns, &c. It consists of two strong side-pieces, into which four or five cross bars are mortised, so as to make the width four or five feet. This frame is supported by four pillars, let into two other side pieces, which raise it about eighteen inches from the ground. The lower pieces, or sides, are curved in front, and mortised into the upper ones; thus making the fore part of the dray not unlike the bow of a boat. Near to each end of the upper frame, before and behind, is made a round or square hole, or curved irons driven into the sides to receive four upright stakes, between which the thorns, &c. are loaded eight or ten feet high. These carriages slide with ease over the pasture lands, without injuring or making any material indenting in the turf.

Ploughs. The old plough, with one wheel, and shortened in the beam, is mostly used on the Cotswolds, though the double-furrow plough, moving with two wheels, is gaining ground, and much recommended for second ploughings and stirrings, &c. With four horses, on level ground, this latter plough will easily manage two acres a day.

The Beverston plough, invented by Mr. Tugwell, with one wheel, is much esteemed in the lower part of the county, but rarely used on the higher Cotswolds, because the numerous stones which lie on the surface interrupt its steady course, better preserved by the common ploughs. On light lands, unmixed with stones, and not much broken on the surface, this plough is highly valuable.

Throughout the greatest part of the Vale, where the soil is strong, the old swing-plough is retained; and it is supposed that there is little room for improvement.

The hammock-plough, used on the Ryelands, differs but little from it in principle, except in being shorter and more compact; yet, though the power is lessened by the shortening of the lever, the ploughman swings it about with ease at the land's end.

The skim-plough, with a share thirteen or fourteen inches wide, is used on the Cotswolds with great advantage: it turns the turf completely over, and will finish two acres a day, with two horses.

The skim-and-go-deep plough pares off the turf, and immediately covers it with four inches of mould, or more, if required. It moves with one wheel, and is used with peculiar advantage, where the land abounds with knot grass. These two ploughs are the invention of Mr. Radway, of Cirencester.

The revolving-plough, invented by Mr. Lumbert, of Wick Rissington, turns all the furrows one way.

Mr. Robert Emmerson, of Shipton Moigne, has contrived a machine for the cultivation of land, which, though perhaps capable of improvement, promises to be of great advantage to the farmer, as, with it, land may without any other instrument be completely prepared for the reception of the seed, and more effectually than by any other set of instruments now in general use in that neighbourhood, at a very reduced, possibly not above one-third the usual, expence. It answers, as far as appears from considerable experience of its uses, the whole end of plough, drag, and harrow: will go over five acres in seven hours, with five horses, on wheat or clover stubble, at two or three inches depth; the same a second time, at five inches; and the land will then be finer than with three stirrings with the plough. Its use, however, as a plough, will much depend on the question, in what degree it is necessary, in ploughing, to turn over the furrow; as, though it stirs the land completely, and makes clean work, yet it does not turn it over, for want of a mould board: it is therefore of the nature of a scuffler, rather than a plough.

Drilling-machines of different descriptions, are in use, though not universally. Most of the cultivators are sensible of the advantages resulting from this capital agricultural improvement; but in the Vale, the tenacious nature of the clay, unless in favourable seasons, impedes the operations of the drill-plough.

Lumbert's underground-draining-plough is much used. See chap. 12. sect. 1.

The ell-rake, on some parts of the Cotswolds, particularly in the neighbourhood of Northleach, used at hay-harvest, and with barley and oats, has some advantages over the common form. It carries from eighteen to twenty-six teeth, twenty inches, or more long, sharpened at the point, and increasing in size towards the rake head, into which they are rivetted. This instrument is dragged by women and children, after them, by a long handle, with little difficulty, as being lightly made, and the points being curved, do not entangle against the ground. It takes a sweep of more than four feet, and saves trouble and time; but, being chiefly applicable to level land, will probably not be introduced into general use in the Vale.

The drag, or harrow, does not differ from that of other places; the size is adapted to the different purposes for which it is wanted.

The scuffler is an instrument of the drag kind, used on the Hills. The "tines," or irons, instead of being straight and square, are flattened to an edge, and curved at the point: they rather cut than tear the soil; and, being placed in a triangular form, divide the sod into numerous small pieces. They are particularly useful on light lands, where much ploughing is supposed to be injurious.

Winnowing-machines, on improved principles, and various construction, are used on many farms, both on the Hills and the Vale, and seem likely, in a few years, to take entire place of the old winnowing-fan.

Threshing-machines are found in few places, the expence being an unconquerable objection to their general introduction. The following account of an active and intelligent cultivator, of Winterbourn, Mr. Ebenezer Ludlow,* is a strong testimony of their utility.

"My threshing-machine was put up by a Scotchman, of the name of Geekie, now living near Bridport, in Dorsetshire. It threshes and winnows about five or six sacks an hour, on an average; it is worked by eight oxen, and requires the attendance of three men, (one to hand up to the feeder, a second to move the straw, and a third to attend the winnowing,) and a boy to drive the oxen. A chaff-cutter is attached to the machine, which requires a woman, when it is in work. My corn is threshed much cleaner than any in the parish by hand, as the farmers have admitted; and with regard to comparative cheapness, I can, without going into any complicated calculation of the opportunities of markets, say decidedly, that I can thresh my corn by the machine, at less than half the expence of doing it by hand. The expence, including buildings, and attaching a cyder-mill and chaff-cutter, is about 300*l.*"

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* Since the writing of this paragraph, Mr. Ludlow has left the farm he occupied in Winterbourn.

These machines are too costly for middling farmers: for general use, the expence must be lessened; and, where thatching is practised, it is an important business to have the straw as little injured as possible, which is not the case with the threshing-machines on a large scale.

One of the latter description has been invented by Mr. Lumbert, and is said to answer the purposes required very well. It is worked by one horse, and the price is from 25 to 40 guineas.

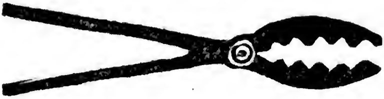
The old wooden-rollers are in common use, but those of cast iron are daily being introduced. One, in particular, first made under the direction of Mr. Rogers, of Foxcote, in the parish of Withington, increases fast on the Cotswolds. It preserves the shape and size of the old roller, hollow, and twenty inches in diameter: common shafts are fitted to it, secured at each centre by iron pins. Every foot in length, weighs a hundred weight, and it is six feet long; so that the weight and price are readily ascertained. Some are fitted up with two small iron bars, rising from each shaft, at the centre, which carry a cross bar, so near to the surface of the roller, as to scrape off all the dirt, weeds, &c. which are collected in its progress.

Radway's chaff-cutter, with two knives, is a powerful machine, and does a great deal of work, expeditiously and well. Three women are employed, one to keep it in motion, and two others to feed it. They work by turns at the different branches, and are able to cut sufficient chaff for eighty oxen a day. It is sold by the maker at Cirencester.

Lumbert's chaff-cutter, with four knives, is a very useful machine, where still greater expedition is required. Price 25 guineas.

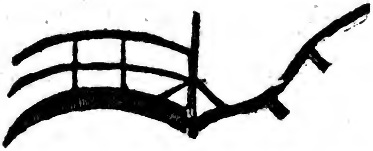
The running hand-hoe makes speedy and good work on light lands. The iron plate, or "shoe," fixed to a handle about six feet long, is adapted in breadth to the width of the drills; it is brought to a point at the end, and has a ridge of iron, rising gradually from about an inch of the point, and keeping the same distance on both edges, by which the mould is thrown off to the roots of the plants. It is pushed forward by muscular strength, and is raised from the ground by a small wheel about eighteen inches diameter. With this instrument a man will easily hoe two acres a day. If the land is much annoyed with thistle, it is proper first to cut them off with "spud-hooks" (small paddles), or draw them, as they are found to embarrass the operation in a trifling degree.

The thistle-drawer is a very useful instrument for the extirpation of the *serratula arvensis.* See chap. 12. sect. 4. It is a wooden forceps, between two and three feet long, with six blunted teeth on the lower ends of each arm, fitted to each other: between these the thistle is held firmly, as near the ground as possible, and with great ease and expedition drawn out, with a considerable length of root.



This instrument has not yet been much introduced into the practice of this county, being in the hands of a few individuals, who first procured it from Wiltshire; but, from the facility and effect of its operations, will undoubtedly gain ground in a county whose lands are so much pestered with this troublesome weed. It is now made at Stonehouse, price 2s.

The cradle-scythe is used in the Vale for cutting beans. Two wooden teeth or prongs, sharpened at the end, of the same length and curve with the scythe-blade, are fastened into an upright, which is fixed on the end of the handle, and kept to its place by two iron rods, one hooked to the blade about eighteen inches from the blunted end, and the other at the same distance on the handle: the prongs are also kept in their places, at about twelve inches apart, by small bars of iron. Thus prepared, the scythe lays the stalks regularly and even on the ground, and with little trouble, ready for binding.



The only addition being to the blade, the handle is not here represented in true perspective, that the other parts might be better seen.

CHAPTER VI.

INCLOSING, FENCES, AND GATES.

THE advantage of inclosing waste, and laying into severalty common field lands, have been so clearly proved by experience, that, in spite of the heavy expences attending the present mode, a great deal has been done within the last forty years, in comparison of what had been done in more early periods. The first Act of inclosure in this county, was of Farmington (12 Anne), in 1714, and the only one during that reign. In the following reign, three parishes were inclosed; in the reign of George II. eleven; and, in the present reign, more than seventy Acts have passed the Parliament for inclosing, or laying into severalty. See chap. 15. sect. 8.

By these proceedings, the landlord and occupier are benefited; the former in an advance of rent, the latter in the increase of crops. On the Cotswolds, many thousand acres are brought into cultivation, which before were productive of little more than furze and a few scanty blades of grass. In the Vale, by the inclosure of common fields, lands have been laid together, and rescued from the immemorial custom or routine of crops—wheat, beans, and fallow; and the farmers have found, to their great advantage, that clover, vetches, and turnips, may be raised in the fallow year, which was before attended only with labour and expence: but, more particularly,

1. Rents and crops are increased. Ten shillings an acre are added to arable lands in the Vale, and in many places twenty, in consequence of inclosure, and a third at least in the improvement of crops; so that lands, which before the inclosure were esteemed highly rented at ten shillings per acre, are now raised to twenty or thirty, and even higher, in proportion to their quality; while crops, which were reckoned a fair average at twelve bushels per acre of wheat, now produce from twenty to thirty, or more. Upon public principle, when population is increasing, it is wise policy to give every encouragement to the inclosing system, which confessedly provides an increased quantity of food.

2. Tythes are commuted. For reasons before given (chap. 4. sect. 3.), I consider this as an advantage of itself sufficient to recommend a general adoption of the system, without an additional argument.

3. Want of drainage is one, among many disadvantages, of open fields in the Vale; and this cannot be remedied but by laying the lands together, and making subdivision fences, with ditches to them, as currents to carry off the surface water. While the subsoil is drenched with stagnant moisture, no grain or seeds can thrive; hence, the soil at the bottom of the deep furrows is unproductive of any thing but aquatic plants; the seed which is sown in them is lost, or sickens soon after it has sprouted, and, if it survives till harvest, carries a thin, short straw, and light grain; but, generally speaking, the only return is made from those parts of the ridges which are raised high enough

to afford depth of soil for the roots, without reaching the stagnated water; and thus, little more than half the land is employed to any useful purpose, though a proportionate quantity of seed and labour has been expended on the whole. On adjoining lands, in an inclosed state, the difference is evident; the drains being open, the redundant water is carried off, and the whole soil left in a mellow, healthy, and productive condition.

4. Turning on the head and fore-lands, is another great inconvenience. These and the long-lands are usually the property, and in the occupation of different persons; and as the occupier of the latter is not obliged to plough or crop at any definite time, it often happens, that by the negligence of a slovenly farmer, the head-lands, which are the best in the field, as being raised high, and kept dry by the furrows of the other lands lying below them, are trampled by the cattle, and torn by the plough turning upon them, just at the time when the seed is sprouting, and in that tender state most susceptible of injury.

5. By the inclosure and conversion of waste lands, population must in some degree be encouraged; and this should operate as one among the motives and end of inclosing. To obtain corn from waste lands, and not to obtain people from the corn, is to rest satisfied with the means without the end.

On these accounts, it is greatly to be desired, that one general and uniform plan, less clogged with expences, were sanctioned by an act of the legislature. I am well aware, that the subject has had the consideration of some intelligent and public spirited gentlemen, and doubt not but that their unremitted attentions will eventually conquer the difficulties which at present prevent the full effect of their intentions. Posterity, however, will scarcely believe, that the expences of inclosing 1000 acres, without taking in the subsequent costs of fences and buildings, amounted to 4,500*l.* in the year 1795; which was the fact in the parish of Turley. Great as may be the future advantages of an inclosure, this operates as an obstacle to the general adoption of the plan. It is probable, in the instance now referred to, the fee-simple of the land, in its waste state, would not have much exceeded in price the actual expences incurred. With this heavy burden, however, attached to it, the change has been in favour of the landlord, tenant, and public. Land which before was only valued for a few miserable sheep depastured upon it, and often subject to rot, is now in a state of profitable cultivation, eagerly rented at 30*s.* an acre, and adding 20,000 bushels of corn at least to the stock of the market annually, or some produce equal to it. In a recent inclosure of Staverton and Boddington, the weight of expence, and complaints of delay, have been considerably lightened and removed, being less than 20*s.* per acre, by entrusting the management to one commissioner, instead of three. Independent of expence, an advantage attends this mode in point of time, which much recommends it. A single commissioner, having no one to consult as to the time of meeting, can proceed with the business whenever he pleases, and need not wait the convenience or slow deliberations of others. In the choice of this commissioner, all parties, in proportion to their degree of interest, should have a voice, and, if possible, be unanimously agreed; and here perhaps lies the great difficulty of the plan. As, however, so much public good depends upon it, any method of accomplishing it is better than none.

In all Acts of Inclosure, it might perhaps be proper, as it would certainly be equitable, to relieve the pressure, which weighs on small proprietors, in a degree not proportioned to the advantages they derive from them: for it should be remembered, that the expence of fencing a small allotment, is considerably greater than that of a larger one, according to the quantity; that is, a square piece of land containing ten acres, will cost half as much as forty, though only of one-fourth value. This disproportion occasions much reluctance in the class of proprietors before mentioned; and though it is frequently overcome by the superior influence of the great landholders, yet the injustice of it cannot but strike the considerate mind with conviction.

An objection is frequently made against inclosures, particularly of common fields, that the end is defeated by the conversion of tillage to pasture. This, however, much depends on the price which the respective articles of produce bear in the market; for the farmer will invariably raise that crop or stock which he conceives will make him the best return: one great object, however, of inclosure, will at any rate be obtained—an improved and more productive state of cultivation in some way or other, and, whatever may be the views of the farmer, they must ultimately tend to the public good.

METHODS OF INCLOSING, AND MATERIALS USED.

New inclosures are fenced round with a double range of post and rail; adjoining, but within the outside range, a ditch is made, and the soil thrown on the interior bank, on which are planted quicksets of white-thorn *(cratægus oxyacanthus)*, in a single or double row; the latter is the best: in forming the bank, the turf which has been pared from the top of the ditch is laid inverted on the outside edge, and the loose mould thrown on the inside, to make a bed for the plants: the plantation is kept clean from weeds for some years, and the bank occasionally repaired. Under this management, the hedge may be thrown open in seven years, and will be sufficiently strong to protect the inclosure. Between the sets and interior fence, is left a space of three or four feet, for the purpose of preventing cattle from reaching over, and biting the leading shoots; on this vacant space potatoes are often planted; the rampant stalk, however, of this plant generally extends to the sets, and prevents the lower branches from throwing out, thereby greatly injuring, if not ruining, the young hedge. It is better to lose the trifling advantage of such a crop, and keep the ground dug and cleaned, than run the hazard of spoiling the whole; and the landlord would do well to prohibit the practice altogether.

The white-thorn plants are either taken from the nursery, where they have been raised from the berry, or gathered in the woods. The former should be of four or five years growth, and are, it is said, the better for having been once before transplanted from the seed-bed: this, however, is seldom the case with quick supplied from the gardener's nursery. Objections are made to wood plants; but if care be taken in the selection of them, they may be used with great advantage; the usual imperfection is want of fibres on the taproot, and in this case they cannot make the desired progress: they are sometimes also of stunted growth, and are then of little value; for, being diseased, much time will be lost before they recover. Nursery-quicksets are sold at 12*s.* and wood-plants at 9*s.* per thousand.

At the time of planting, they are cut down to one or two buds, and placed rather in a sloping situation in the bank; sometimes almost horizontal, with their heads on the edge of the bank, and the roots in both cases towards the interior fence. The inconvenience of horizontal planting is, that in the winter, from frost, and in the summer, from rain, the slope of the bank moulders away, and leaves a considerable part of the plant exposed. The better practice is, to set the plants six inches within the bank, and thus leave room for the wasting soil to be restored, and kept clear from weeds, which is essential to a good hedge: the hoe in general is sufficient for this purpose; but if bind-weed *(convolvulus arvensis)* grows among the plants, it should be hand drawn; in any other way, it would be vain to attempt eradicating it, without material injury to the lower shoots.

To be full and close at the bottom, is the first character of a good fence; it is therefore usual, at two years' growth, either to cut the shoots off near the ground, and every spring afterwards to reduce it with the shears, so as to suffer it gradually to advance in height; or at six, seven, or eight years, to "plash" or "lay" it; that is, to cut off every other stem nearly at the ground, and lay the others in an angle of forty-five degrees, having first cut them nearly through at the same distance as the rest from the bottom, to make them capable of taking the required position; or, thirdly, to cut off every other stem, or nearly so, as before, and the rest of different heights, according to the quality of the hedge, so as to keep the fence three or four feet high; in all cases, the ditch and bank are to be repaired, to guard the young shoots from being bitten off by cattle. Each of these methods has its advantages; but much depends on the intention of the fence, and skill of the workman. By the first, the hedge is carried up with a regular, bushy, and almost impenetrable body progressively to the required height; it is, however, productive of no thorns for the supply of decayed fences, and therefore less calculated for the use of the farm, than gardens or small plantations, where neatness and strength only are consulted.

By the second, which is most usually practised, a strong hedge is raised, though the bottom is often thin and faulty, in consequence of the juices having been carried to the higher branches, and the shoots which are laid down are apt to die, and leave the hedge encumbered with dead wood, or, if they live, throw out their shoots only at top; the chief dependence being on the produce of the stumps near the ground: with this management, however, the fence immediately becomes a secure one.

By the third, if the stems are picked out with skill, a capital fence may be made, and a great supply of thorns obtained, which, on old inclosed farms, is an important object. It is, however, in some degree, subject to the same disadvantage as the former; by being left to grow so many years in its own way, the side-shoots fail at bottom, where the principal strength is required.

The elm *(ulmus campestris)* is never planted purposely for a hedge, though, in the Vale, where this tree is reproduced from the old stools in abundance, a tolerable hedge is often formed from the innumerable shoots which spring up, where a tree has been cut down; and as these shoots will bear the shears well, they may be formed into a handsome fence, but never can make a strong one.

The black-thorn *(prunus spinosa)*, though seldom planted for the purpose, has many good qualities in common with the white-thorn, and one exclusively: it seldom, if ever, blights, which is the case, more or less, with the other, in the most favourable seasons: hence, quick-hedges are often disfigured with lime-wash, to prevent the attack of blight or insect. It is, however, too open and straggling in its branches to make a good hedge. The same observations apply to the bullace tree *(prunus insititia)*.

These, together with the hazel *(corylus avellana)*, dog-wood *(cornus mas)*, marsh-alder *(betula alnus)*, common elder *(sambucus nigra)*, and some other intermixed with briars, are principally found in old hedges; but none possess any great power of resistance, and therefore are seldom planted. The hazel, indeed, by the temptation of its fruit, defeats the intention, as do some others which have been recommended, among which are chesnuts and medlars.

The chesnut *(fagus castanea)*, as a tree, is very valuable: for the purposes of building, it is scarcely inferior to oak, grows faster, and bears a superior fruit. Acorns are eaten only by swine; chesnuts are a favourite and nutritious food for men, and many beasts; but this tree makes a bad fence.

Medlars *(mespilus germanica)*, might be raised in great quantities, by being engrafted on white-thorn stems; but the hedge-row is an inconvenient situation for them: it is bad policy to increase temptations to theft; the idle among the poor are already too prone to depredation, and would be still less inclined to work, if every hedge furnished the means of support.

The practice of planting timber-trees at all in hedges, is liable to objections; for if the tree be left to take its natural growth, which is the best mode of raising good timber, the lower fence is ruined by its shade and drippings; or if they are cut up, and shredded into naked poles, or pollarded for the sake of lop or fire-wood, the timber is injured, and the beauty of the tree destroyed. A better plan is to assign certain spots on an estate for the purpose of raising timber-trees only: this would eventually be no waste of land, because the grass or corn growing near the hedges, which are filled with timber or fruit-trees, is worth little or nothing: in these small inclosures, at the angle of a field, for instance, the trees might take their natural growth; and this would be more rapid in consequence of their being planted in clumps, and protected.

If, however, the old mode of planting in hedge-rows be continued, the ash seems best adapted to the purpose. The timber is in some respects superior to elm, and in various cases useful where the other cannot be applied; in durability, it almost rivals the oak, and in its growth is improved by being kept to a single stem, the only mode of treatment on which trees ought to be admitted into hedge-rows at all, but which few other trees will bear. The oak and beech, particularly, when so large as to become heart-wood, seem to be much injured by the loss of their side-branches; a retardation of growth is the immediate effect; and it is said, that the oak will not thrive after this operation, for ten years: and of the elm, though apparently suffering less, it is however observed, that the finest and soundest trees are those which have been most left to their natural growth.

In the Forest district, the holly *(ilex aquifolium)* grows naturally, and, though much neglected, seems capable of being planted with great advantage for hedges. Where it has happened to grow unmolested in the hedge-rows, it forms an impenetrable barrier, and, being an evergreen, is beautiful in its appearance through all seasons. The mode of raising this shrub, is the same as the white-thorn, from berries: it bears the knife equally well, is liable to no damage from blight or the cropping of cattle, and is inferior to the quickset only in quickness of growth, which, however, it compensates by durability.

On the Cotswolds, the general mode of fencing an inclosure, is with stone-walls; plenty of materials for which are to be had with little trouble. This is an unproductive fence, and continually in need of repair, as being generally put up without lime or other cement. On some estates, quicksets have been tried, and, though they like a deeper soil than the Cotswolds generally afford, yet thrive tolerably well under good management. The best method is, to plant them near to stone-walls, by which being protected from the severity of the weather, while young, in time they acquire hardiness to stand against it, and afford an useful shelter to the cattle.

Many plans have been suggested to diminish the expence of protecting young hedges; but it is questionable, whether any mode superior, or even equal, to rended post and rail, can be adopted: it is stronger, and more durable, than any other, though certainly the most expensive. The following comparative statement will shew the difference.

Dead hedge, 2*s*. per perch or lug, single. Two sets will be required in seven years, which will therefore make it 4*s*.

Dry walls, four feet eight inches high, on the Hills, 5*s*. per perch, including all expences.

Post and rails of oak poles, from 5*s*. to 6*s*. single.

These are the only methods worth attention in the county.

The dead hedge fence is cheapest, but not so lasting or secure, nor can materials always be procured.

Wall fencing is strong, but applicable only to the Cotswolds, and a few places in the Vale.

Post and rails are the most expensive, but durable and secure, and, at the expiration of the term, worth half the original cost. That kind of fence, however, will be cheapest, which is to be found in the neighbourhood where it is wanted; and, whatever the expence may be, it is altogether useless to plant, without protecting the plantation against future injury.

Fences for farm-yards, in situations where stone and brick for walls are scarce and expensive, are made with sawed oak posts, and sawed elm rails. The posts are usually four feet and a half high, besides a foot and a half let into the ground; and in size seven inches by five; the rails are eight feet long, nine inches wide, and inch and half thick. Three of these are mortised into the posts, and form a very strong and durable fence. The workmanship is done for 8*s*. per perch.

The five-bar gate is in general use through the county, and differs not materially from that of other counties. In the Vale, it is made of sawed oak or elm; but on the Cotswolds, where these materials are scarce, the gates are little more than strong hurdles, made of split ash, or willow, with little workmanship or skill.

CHAPTER VII.

ARABLE LAND.

SECT. I.—TILLAGE.

About 300,000 acres are under tillage in this county. On the Cotswolds, it is the practice to sow their crops on one ploughing; experience having proved, that frequent ploughing on these light soils weakens the staple, and is productive of injury. Mr. John Haines, of Baunton, near Cirencester, manured and ploughed up, in November, a small parcel of wheat stubble, and left another portion in the same field untouched till the 5th of February, when that was broke up, and the first parcel re-ploughed at the same time. Both received the same proportion of manure in quantity and quality. In June, the distinction was visible at a considerable distance; the crop on that which had been twice ploughed, appeared sickly and weak in the stem or blade, while the other wore a healthy appearance, was strong and vigorous, and, at harvest, superior in the quality of the grain and abundance of the crop.

Independent of the lightness of soil, which may in great measure be remedied by folding and treading (chap. 1. sect. 4.), I think that the even numbered ploughings* might produce the effect complained of: ploughing is intended to pulverize the soil, and expose a new surface to the atmosphere: the soil of this district is already sufficiently reduced, and on that account alone would not require to be moved at all; but by the action of the plough, the surface, which had, during the growth of the last crop, by exposure, inhaled the saline particles depositing from the atmosphere, is now depressed, with or without manure, to its proper situation for giving nourishment to the roots of the new sown grain; while the subsoil, having in some measure been exhausted of its fertilizing principles, is raised to the surface, to receive a new supply from the joint operation of the sun and atmosphere. In case of two or four ploughings, the same exhausted soil is applied to the roots of the plants; and, when naturally poor and meagre, it is hardly to be expected that two good crops can be raised in succession, without attention to this circumstance. In the Vale, the land is never ploughed twice for any crop, but either once as for beans, or three times on the fallows for wheat. When, indeed, wheat is sown under furrow, the plough enters the land a fourth time, but so lightly as not to disturb the soil, which had been turned in by the last ploughing. This practice, however inattentive the farmer may be to the principles of it, is founded on the experience of ages, which is generally a pretty good test to direct the judgment.

On the clay lands of the Vale, the plough will not at all times work, and it is an important concern to catch that moment which is most favourable. This kind of land soon becomes either too wet or too dry for work; in the first case, the plough clogs, and the whole becomes miry from the treading of the horses; in the last, it is broke up with great difficulty, and often imperfectly ploughed; a very powerful team, not uncommonly of seven horses, is required, which, as well as the plough, are sometimes strained and injured by unusual exertion and resistance.

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* I am aware, that this hypothesis does not exactly coincide with the opinions of some very able agriculturalists; and therefore it is here inserted in the text with much diffidence, and open to investigation.

The strong loams partake in less degree of these inconveniencies; but the light or sandy loams will work with ease at any time, according to the convenience of the farmer.

Peaty soils have nearly the same advantages in point of ploughing, but require the aid of rich manure for the raising of good crops.

The clay lands of the Vale are thrown up in ridges, much higher than would be necessary, if proper drains were made for carrying off the stagnant water; which, however, is impracticable under the present management of the open common fields.* Where an inclosure has left the farmer at liberty to follow his own good sense and judgment, he reduces the high ridges,† fills the furrows, and brings the surface nearer to a level; the superfluous water is collected from smaller drains and grips, in large receiving sewers: and the deep furrows, which, from redundancy of moisture, carried little else but couch and aquatic plants, are brought back to an equal degree of fertility with the rest of the field. The farmer is aware of the evil, but his hands are tied up from improvement, while the lands are entangled with each other, and subdivided among so many proprietors of different tempers, and various degrees of industry. See chap. 6.

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* A person six feet high may stand in some of the furrows, and not be able to see the top of the second ridge from him.

† A great improvement is now adopted by some sensible farmers, to get rid of these deep furrows; which is, by ploughing up a small ridge between the two high ones; this renders the land much drier, and more healthy, by raising the furrows, and thereby causing a better draught for the surface water.

SECT. II.—FALLOWING.

The practice of fallowing is still pursued in the Vale, though the opinion, which has for ages prevailed, that *whole year* fallows are necessary on clay lands, begins to wear away. In the open common fields, where the properties are intermixed, the occupiers numerous, and of course the opinions various, it is difficult to deviate from the old custom. Prejudice, and an attachment to the practice of their forefathers, stand in the way of a general improvement in this respect. Small proprietors, perhaps of a single acre, or even of none, in the common fields, claim, in most parishes, an unlimited right of common, and derive considerable advantage, in the support of a large stock of sheep, during a whole winter and summer on the fallows. Thus, a single occupier, perhaps the most inconsiderable in the parish, has the power of obstructing the rational views of the majority, and he seldom fails to exercise it.

Much is still urged by the advocates of the old system in favour of frequent fallowing; although the more modern farmers begin to see the absurdity of letting their land lie so frequently unproductive. At present, however, this goes little farther than getting a "catch crop" every other fallow, or once in six or eight years, according to the custom of the district: For though agricultural writers seem to have proved, that whole year's fallows are in no case necessary, yet a long time will probably elapse before either landlords or tenants in the Vale will be so far convinced. There is, indeed, in some parts a soil so peculiarly untractable, and such a propensity to the growth of couch-grass, that it is somewhat to be doubted whether such land can be cleaned, otherwise than by the repeated ploughings, harrowings, and pickings of a whole summer. With care, however, and under a good system of cultivation, this labour, loss, and expence, need not be incurred oftener than once in ten or twelve years. See chap. 16. The slovenly manner in which a great deal of the Vale lands is cultivated, occasions the loss of one in three or four crops; and, even under this management, the land is not clean.

When circumstances allow a catch crop, peas are considered as good change for land, which has for so many years been planted with wheat and beans: but clover, vetches, or potatoes, are preferable. The almost inestimable profit of clover is universally known: vetches form an excellent food for horses in the spring, and sheep in summer, preparatory to wheat, or, if not used as green food, may be seeded to advantage. Potatoes, besides the value of the crop, either for sale or food, are of great service in preparing the land for wheat on stiff soils.* If a good dressing of manure precedes the potatoes, the effect is experienced more beneficially in the succeeding crop, than when the wheat is sown immediately upon it.

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* The difficulty of clearing the land entirely of potatoes, is the only objection to this crop; in this respect, they produce as much inconvenience as the worst weeds.

Two crops and fallow are the general practice in the open fields below Gloucester, and three crops and fallow above: the latter system, though it gains only one crop in twelve years, has yet considerable advantage over the first, as it affords a greater variety of produce, and, if that be necessary, gives the soil more time to recover, before the same seed be repeated. When however, it is considered through what a length of years wheat and beans have been planted in continued alternation, with the interval only of the fallow year, and not extraordinary management, one is surprized either at the fertility of the land, which, under so many disadvantages, still produces twenty bushels of wheat, or thirty of beans, on an acre, or led to doubt whether a change of crops is so essential to fertility as is generally imagined. A field in Shipton Moigne is asserted, by the inhabitants and the tenant, to have been for thirty years, preceding 1800, sown with barley, except once only with wheat, and once with turnips. The wheat is said to have run chiefly to straw, and little corn: the average crop of barley was from twenty to twenty-four customary bushels of nine gallons and a half, per statute acre.

The land is ploughed three times in the fallow year, and one in each of the others. The ridges are "thrown down" as soon as is convenient, in March; about Midsummer, the land is ridged up, and on this the manure is spread. In August, it is ridged or taken up again. These ploughings are called one fallow, two fallow, three fallow; and, during these ploughings, if the land is foul, the usual modes are followed of cleaning it, by dragging, picking the couch, and burning it. Soon after Michaelmas, the wheat is sown on the three fallow, and either lightly ploughed or harrowed in: if ploughed in "under furrow," it is again ridged up, and a man follows with a spade to "land mend;" that is, to "knock up" or lay the edges of the furrows plain; or a drag is fastened to the side of the plough, and, moving parallel with it, performs the operation of land mending with less trouble, but less neatness also.

On every year's land, instead of fallowing, tares or vetches are often sown *(see next section)*: in this case, the land having been laid up high for the wheat, and being necessarily kept high for another winter's crop, it is usual first to "slit" down, that is, to run the plough up and down the top of the ridge, and throw off the mould on each side, thus leaving a hollow or channel in the middle: the mould thus thrown out, is scattered along the land on each side, with the spade, and then the next process is to ridge up, which completely fills the hollow, and keeps the land round and regular at the top, which, without this management, would be gathered too much to a high, keen edge or point.

SECT. III.—ROTATION OF CROPS.

On the inclosed lands of the Cotswolds, the general system is, 1st, turnips; 2d, barley, with seeds; 3d, seeds mown; 4th, the same grazed with sheep and neat cattle; 5th, wheat; 6th, oats, vetches, or peas: if oats, frequently laid down with saintfoin.

This is called "seven-field husbandry:" the whole of the land, however, in this rotation is not laid down in saintfoin, but about a seventh part of the pea, or oat stubble. Thus, if a seventh part be laid down at the end of the first rotation, that will be ready to be broken up at the end of the second, and, of course, will not again be put to saintfoin, till about forty-two years afterwards. See chap. 8. sect. 2.

On the strong lands, in the Vale below Gloucester, 1st, fallow; 2d, wheat; 3d, beans.

Above Gloucester, 1st, fallow; 2d, barley; 3d, beans; 4th, wheat. Instead of the following fallow, sometimes tares or vetches are grown and fed off: or clover sown with the crop preceding the fallow.

In the Vale of Evesham, clover is sown every other fallow, or once in eight years; that is, half the barley land is put to seeds, which are grazed or mown the next spring, and then seeded. An opinion prevails, that land tires of clover, if more frequently repeated.

On the rich loams, 1st, turnips, where inclosed; 2d, barley, with seeds; 3d, seeds fed off; 4th, wheat.

On sandy lands, as the Ryelands in the Forest district, 1st, turnips; 2d, barley, with seeds; 3d, mown; 4th, grazed; 5th, wheat; 6th, peas, or pouse (that is, peas and beans mixed), or vetches alone.

Beans are sown with peas, chiefly with the view of supporting them from the ground. On this land, oats are not sown. Another practice on these sands is, to sow wheat on clover ley, then fallow, barley and peas. Manure is laid on for the barley. The first system is most general.

The following rotation is strongly recommended by an intelligent cultivator, resident at Welford, for low, quick, gravelly soils. The wheat crops are excluded.

First, seeds after barley, to remain two years; 2d, breast plough, burn and sow with turnips; 3d, oats; 4th, immediately after the oats are harvested, manure a part, and sow with winter tares for spring food for sheep, and the remainder with spring tares, to keep up a regular succession of feed; as the field is gradually cleared, sow with turnips to support the sheep through the following winter; 5th, in the following spring sow the whole with barley, laying down with seeds best adapted to the soil.

The reasons for excluding the wheat crop from this arrangement, are, first, the uncertainty of a return equal to the expence, which experience has proved. Secondly, the plants being frequently thrown out of the ground by the winter and spring frosts, an obvious consequence of the light and hollow texture of the soil.

The oat crop is recommended to precede the tares, because, being usually ripe early, and soon harvested, the latter may be sown in good time, so as to gain strength before winter, which is of material consequence to bring them into early use.

Barley follows the turnips, because they are fed off late in the spring; but do not interrupt the sowing of that grain, which will allow being put into the ground later than oats, or any other.

SECT. IV.—CROPS COMMONLY CULTIVATED; THEIR SEED, CULTURE, AND PRODUCE.

WHEAT.

Preparation. On the Cotswolds, wheat is sown on two years ley of clover and ray-grass; sometimes, when the turnips have failed, that land is sown with wheat, and laid down with seeds, which are harrowed in among the young wheat in spring, and are fit for use the following year.

In case of a failure in the barley crop, vetches are sown, which are fed off with sheep folded on them, and the land is sown with wheat. This practice is chiefly confined to the uninclosed fields.

The manure arises from the sheep, either folded, or grazing the seeds; and, on one or other of these preparations, the wheat crop principally depends.

Much ploughing being esteemed detrimental, the land intended for wheat, is ploughed once only, as soon as it can conveniently be done in the summer, so that a month or more may intervene before sowing. In the neighbourhood of Stow, and other places, where the land is "tough," it is the practice, in dry seasons, to plough one furrow and leave one; which is called "risbalking," or "strike balking." The land is immediately "scuffled," or torn to pieces with the scuffler, and left in that state till sowing time.

The land at the time of sowing is oftentimes quite green with weeds; and indeed some farmers say, the greener the better. The future crop of weeds is certainly not so likely to be abundant; the vegetating weeds being destroyed by the drag, and no new seeds turned up for a new crop.

On the uninclosed parts of the Cotswolds, the ploughings are usually three, on a summer's fallow.

In the lower Vale, wheat is planted on a whole year's fallow, managed as described, chap. 7. sect. 2.

In the Vale, above Gloucester, where wheat follows the bean crop, no manure is used. If there be time after the beans are off, the land is "brushed," lightly cast down, then harrowed to pull out the bean stalks and filth, which are burnt: then the land is ploughed deep, and ridged up ready for sowing.

The bean stalks, when ploughed in, are a harbour for a variety of insects, and therefore necessary to be destroyed. The cottagers often draw them for lighting their fires: or, if they are to be burnt on the land, the roll is drawn over them, and, thus being broken down, are easily brought together with the harrow.

COTSWOLDS.

Putting in. The methods most in use are, (according to the broad-cast system,) either below or above furrow. In the first, the land is ploughed about three inches deep; it being the opinion, that on these light lands, if the plough went deeper, the best prepared mould would be buried in the subrock. The seed being sown, and thus ploughed in, the harrow is lightly dragged over. In the second, the seed is dragged in without ploughing; and in both cases, if the land be light and moist, it is, immediately after, well trodden with sheep and other cattle, with the view of giving firmness to the soil, and enabling it to retain its nutritious juices. This treading is sometimes repeated, when the wheat first makes its appearance, with this difference, that dry weather is now chosen for the purpose.

The drilling system is only followed, where the soil is pretty clear from stones; for, in some parts, they lie so abundant and large on the surface, that it is very difficult to preserve a straight course with the plough, and, of course, to deposit the seed regularly.

On the declivities of the hills, in the Vale and Forest district; similar methods of putting in are observed; but in the two latter, drilling is every season more and more practised. Some farmers have objected to drilling, on the Vale lands, on account of the supposed necessity of running the plough down the ridges, or lengthways, because the close order in which the plants grow in the line, prevents the water from running off down the sides; the consequence of which is, the rotting of the roots; whether this be a just objection or not, it may be obviated by drilling across the ridges, which is easily performed, when the land is in a dry state, and the furrows drained of stagnated water. In many parts of the Vale, wheat is set by hand and line, but the difficulty of getting on with the work at the proper season, on a large scale, for want of hands, operates against the general introduction of this great improvement in agriculture. See chap. 7. sect. 2.

Sort. Red lammas is generally sown on the Cotswolds; the seed is procured from the chalk lands of Berkshire, or North Wiltshire, and some Essex duns. On account of the early sowing, it must be one year old at least, but beyond that age, its growth is reckoned uncertain.

Cone is sown, though not exclusively of lammas, on the strong lands of the Vale; and, in the Forest district, cone or red lammas, according to the nature of the soil. White lammas is in use among a few farmers, who think that it ripens earlier, requires less field-room, and is equally productive with red.

In the choice of seed, great caution is necessary, especially if the opinion be well founded, that smut is an original disease of the grain. The wheat of the Cotswolds is little liable to smut, and experienced farmers assign two reasons; one, the use of old seed; the other, sowing on stale furrow. Perhaps it may be difficult to explain the rationale of this; yet smut certainly does not prevail so much on the Hills as in the Vale, though it is found more frequently there than formerly, and, as it is supposed, from want of care in the choice of seed, or sowing too soon after ploughing.

That smut will sometimes produce smut, is evident from the following fact. Some cottagers, who occupy small portions of land in the neighbourhood of Tetbury, (which run long and narrow, in the nature of common field land, and adjoining to each other in the same field and same soil,) sowed with wheat in 1801. A few of these cottagers bought some smutty wheat of a farmer in the parish, for seed, because it was sold cheap; the others sowed good seed. The first had smutty crops, not exceeding four bushels to the quarter of an acre; the latter had a crop perfectly free from smut, and from eight to ten bushels on the same proportion of land, though adjoining to, and intermixed with, the other lands which bore a smutty crop.

That this, however, is not always the case, appears from the following experiments made by myself in the two last years. In November 1804, I sowed three parcels of wheat: the first was the half of some fine seed from the Cotswolds; the second, the other half, well mixed and compleatly tagged with smut-powder, taken from a smutty ear which grew in the Vale; the third, was picked from smutty ears, and well tagged with smut-powder from the same ears. The seeds were sown in drills, at a considerable distance from each other, in ground that had been some time dug. They all produced good ears, well filled, and without smut. In November 1805, I sowed some grains, taken from a quantity in the market, as black as if they had been shaken in soot: the ground had been dug a month before; the wheat grew luxuriantly, and the result was the same as in the former experiments. Still, whatever is the cause of smut, it is not prudent to risque a crop, on the chance of getting good corn from smutty seed.

Where seed is suspected of being tainted with smut, the precaution of steeping, though not the practice of the Cotswold farmers, is, in the Vale, with a few exceptions, general. Steeping may not effectually cure, or prevent the disease, but is fairly supposed, from experience, to do much towards it. The smutty grains, which are specifically lighter than the prepared water, are separated by the process of washing, and brought to the top; and grains that have been "tagged," that is, blackened at the hairy end by the smut-powder, in threshing and winnowing, will probably be cleansed.

The steep is usually made of salt and water, strong enough to bear an egg; or stale urine, soap-lees, with corrosive sublimate, or arsenic mixed with it: in this, the wheat is immersed and frequently stirred; the light grains are taken off, and, after twenty-four hours, sound grains only are left behind: these are then taken out, and having been dried in cold slaked lime, are ready for sowing.

Independent of the possible prevention of smut, this good may arise: the nauseous or poisonous qualities of the ingredients used in the lixivium, may prevent insects from feeding on the sown grain, and, during its growth, continue the same protection, till the ear is ripened.

Quantity of seed. When sown broad-cast, from two and a half to three bushels per acre; when drilled, about half the quantity; and, when set by hand, not more than three pecks.

Time of sowing. On the Cotswolds, seed-time commences immediately after the first sufficient fall of rain in August: on these soils, plentiful showers are necessary at the time of sowing; and when the chance of such a season is lost, the seed lies a considerable time in the ground without shooting, for moisture soon sinks away through the crevices of the sub-rock; and if a long drought follows a dry seed-time, the blade does not acquire sufficient strength to withstand the cold winds of winter; besides the loss sustained from birds, vermin, and insects, during its unvegetating state. Other causes are assigned for early sowing; but all are agreed, that the chance is much against a good crop, unless the ground be well covered before October. In the Vale, November is the most busy month for wheat sowing; but, according to the nature of the land, and kindness of the season, the time varies from the middle of October to the latter end of December. In the higher parts of the Vale, wheat may be sown still later, and succeed; but it is not the practice generally followed.

Culture. In seasons particularly favourable and growing, the wheat becomes rank in autumn; and, to countervail this, or check its rampant growth, a flock of sheep is turned upon it, but not kept there long enough to eat off more than the luxuriant leaves: the same plan is adopted in the Vale in the spring, but for a different purpose; the sheep are here allowed to eat the plants close to the ground, which force the root to throw out a greater quantity of collateral shoots.

Hoeing is much practised, but not so generally on the Cotswolds as in the Vale and Forest districts. On the former, the weeds are sometimes cut up with "spud-hooks" or paddles; in the latter, few farmers hoe less than twice; the first hoeing is begun as soon as the weather will allow in April, and the second follows speedily after, that it may be compleated before the wheat "tillers," and the stalks become liable to be bent or broke. Sometimes the second operation follows immediately on the first, for the hoer goes down the ridge, and returns over the same ground again: the weeds soon wither sufficiently to shew where any have been passed over; and this is perhaps the best method of making clean and effectual work.

Hoes are of various sizes, suited to the work; but in general they are from five to six inches in the plate, with the corners rounded off.

This work is performed by men, women and children, but oftener by the two last. It requires attention and a quick eye, at the same time to stir the surface well and leave the plants at a proper distance, which must be ascertained by the nature of the crop, and fertility of the land. If the plants are left to crowd each other, the heads will be small; on the other hand, should a distance, greater than at first might seem desirable, be left, yet if the land be in good condition, the plants will have room to "stool" out, and the heads will be larger and more productive. Cone wheat throws out more than Lammas, and will therefore allow a greater distance; but, on an average, six inches between the plants is esteemed sufficient.

The price depends on various circumstances—soil, weather, cleanness, &c. On the stiff clays of the Vale, 7*s.* 6*d.* per acre, twice doing, are given: on the hills and sands, as low as 3*s.* 6*d.*; and on drilled or hand-set crops about the same.

If March proves a dry month, rolling is much used in every part of the county; and, by closing the soil, which has been hollowed up by the frosts, is found very much to assist the young plants. Even after the greatest care of two hoeings, charlock, or wild mustard plants, will be left among the wheat, which a good farmer destroys by hand-pulling, as soon as they come into blossom.

The necessity of keeping growing plants of every kind clean, with any expectation of a favourable crop, being admitted, the advantages of hoeing are self-evident. The weeds with which arable lands are infested, are luxuriant in their growth, and, unless checked in their early state, generally get the better of the more valuable plants that are near them; or, if of the creeping sort, exhaust the nutritious particles, and, by covering the ground, keep up a kind of stagnant moisture on the surface, at the same time excluding the atmospheric influence and vegetating warmth of the sun.

Harvesting. The time of cutting wheat varies two or three weeks in different districts, depending somewhat on soil, but more on climate and exposure to the sun.

On the Cotswolds, the wheat often lies on the ground more than twelve months; and, though early sowing, of late years introduced, has forwarded the harvest considerably, yet it is still a fortnight at least behind the Vale. This is owing to the severity of the climate.

In the Vale of Evesham, the richness of the soil, and mild temperature of the air, unite in producing an early harvest. On the Ryelands, the same happens from the hot nature of the sands; and the lands on the western bank of the Severn, are earlier than the opposite side, by a fortnight at least, owing to the exposure to the morning sun, though the soil is stiff, red, marly clay.

The mode of cutting, is with the common reaping-hook or sickle; with this difference only, that, on the Hills, the stubble is left shorter than in the Vale. The reaper is followed by a woman, who binds into sheaves; these are "stucked," or placed upright, in parcels of ten, and, at a proper time, carried to the yard, and ricked on staddles; the ricks being neatly thatched and secured from the weather, remain (unless the demand of the market be urgent) till the next spring; very little, particularly on the Cotswolds, being threshed in the winter. On farms, strictly arable, that time is employed in getting out barley, peas, and oats: and this is probably a more just reason, than what an able author has assigned, "the strength of the farmers, and the practice of sowing old wheat." It seems, that the farmer is making as quick a return as possible, (unless he call in the aid of the threshing machine,) by bringing his barley, oats, and peas, into the market, which are always wanted at an early period, for malting, and for the various uses of feeding, besides that the straw of each is necessary for winter fodder. Horses and beasts are put to straw during the winter; and peas-haulm, cut with hay, forms excellent food for the former.

The price of reaping wheat, by the acre, is from 6*s*. to 8*s*. 6*d*. with six quarts of drink in the Vale, but less on the Hills: this includes the expence of binding and stucking.

Threshers, or "taskers," as they are called on the Hills, have 3*s*. 4*d*. per quarter for threshing; and the price differs but little in the Vale.

Produce—From ten to twenty bushels, or an average crop of fifteen, per acre, on the Cotswolds. In the Vale, from twenty to thirty, and even forty, on high conditioned lands.

The stubble is mowed with the scythe, at any leisure time in the winter, but seldom ploughed in. There is, however, a difference in the manner, or rather effect, of cutting. On the Hills, where it is left short, the mower guards his leg with a bundle of straw tied round it, and, by a peculiar motion of the scythe, draws the stubble in a round heap to his leg: this is called "bagging, or hacking up to the leg," and is generally day-work. In the Vale, it is mowed like grass, left in swathes, and afterwards raked into heaps: then it is "drawn," or picked, and, being tied up into small sheaves, is in a ready state for thatching.

The price is from 1*s.* 6*d.* to 3*s.* per acre for mowing; or 9*d.* per thrave of twenty-four sheaves, for mowing, raking, drawing, and tying with osiers ("withs"), and drink. In this state, they are sold from 2*s.* 6*d.* to 3*s.* per thrave.

From arable lands, near a large town, a very considerable profit is derived from the sale of wheat-straw for litter for horses, and other purposes; and this is also an inducement to threshing earlier than in other more distant places. A statute acre will produce from three to four thraves of sheaves, or "boltings," of straw, each bolting weighing twenty-four pounds. As, however, the farmer is not confined to any definite weight, the straw is more commonly sold by the ton. The average price of a ton is about two guineas, delivered, or 10*s.* per thrave of twenty-four boltings, each weighing twenty-four pounds; and an acre will be worth, by this calculation, from 30*s.* to 40*s.*

It would be bad husbandry to sell the straw from the land, if an equivalent return were not usually made from street soil, or the rich dung of the stable; but in the neighbourhood of Gloucester and other towns, the loss is amply repaired from these resources.

BARLEY.

Preparation. On the Cotswolds, immediately after the turnips are fed off, the land is lightly ploughed, and the seed harrowed in. Seeds are usually sown with the barley, in the following proportions: one bushel of ray-grass seed, six or eight pounds of broad-clover, with three or four pounds of Dutch clover, on an acre. Various mixtures, however, are used, according to the judgment of different farmers.

In the Vale, the land has generally a winter, or whole year's fallow; and the manure is laid on previous to the last ploughing, as was observed, chap. 7. sect. 2. About the middle of April, or beginning of May, following the fallow, the land is lightly cast down; but before this be done, it is the practice of some farmers to throw about one quarter of the seed, intended to be sown, over the land, which is then lightly ploughed in, and the remainder being immediately sown, is harrowed in.

On some lands in the Vale, which are called "every year's lands," where the routine of crops is less restrained, it is not unusual to grow barley immediately after wheat. In this case the land is ploughed up against winter. In frosty weather, manure is laid, and spread over the ridges, which lies till March, when the land is again "stirred," and, in April, is a third time ploughed, and the seed sown as before. During these ploughings, every care is taken to clean the land from couch and other filth.

If turnips precede, the first ploughing commences as soon as they are either fed or carried off; and, when the time for sowing arrives, another ploughing, and the land is harrowed and cleaned as much as possible, for the reception of the seed.

Sandy soils are ploughed deeper than those of the Hills, and, having been well dressed with manure for the turnips, want no other preparation.

Sort. Seed-barley, both for Hill and Vale, is procured from the Berkshire chalks; that which originally grew in the Isle of Thanet is preferred by many.

Quantity. According to the quality of the land, from three to four bushels are sown broad-cast on an acre; in a few instances, the quantity has been reduced; but the opinion, that it is necessary that the ground should be completely covered with barley, operates against the general introduction of the drilling system.

Time. Early sowing has been introduced within the last twenty or thirty years. Active farmers on the Hills, sow as early as the beginning of March: others make choice, for their best crops, from the 12th to the 20th of March: but this depends on the state of the weather. The greatest quantity of barley, however, is sown from the beginning to the 20th of April, and even this is governed by the previous work to be done. Peas and oats must be got into the ground first. On the sands, barley is always sown in April, but that is generally the best crop which is put in during the first week.

On the clays, the season of sowing is still later. The beginning of May is reckoned a good time, and many instances occur so late as the latter end of it, and good crops following; but it is not the general practice to defer it to so late a period, where the land can be cleaned well at an earlier time.

Culture. The seed being sown, is harrowed or dragged in, according to the nature of the soil. On the shallow soils of the Cotswolds, large flat stones are frequently turned up by the harrows: these are picked off and removed, but small rubbly stones are left, it being reckoned rather injurious than otherwise to take them away. This process is followed by a heavy rolling, and nothing is afterwards done till weeding; which is performed with little trouble by women and children, who sometimes draw by hand, or, with spud-hooks, cut up thistles and other large weeds.

On the clays, the management is nearly the same, except that, instead of rolling, heavy beetles and three-pronged forks are used to break the large clods; for the continued dry weather, which often happens at the season of barley sowing, leaves the land, after ploughing, in a very rough state, which the heaviest drags cannot reduce to fineness. When, however, the season is favourable, that is, if a little rain has succeeded the ploughing, and left the clods easy to be pulverized by the harrows, and the weather is dry at sowing, the roll is used; otherwise it is considered as giving too great a closeness to the land, which might even prevent the seed from shooting through it.

On marly clays, the practice of breaking the clods answers a second good end, as, by laying them thus in a state of diminution, open to the influence of the sun and air, the soil slakes, and, after rain, adheres close to the plants, affording to the root continual nourishment, through the stages of their future growth, till harvest.

Harvest. Barley in every part of the county is mown, then repeatedly turned in the swathe, till the weeds, &c. are sufficiently dried, to prevent overheating in the mow or rick; afterwards gathered with long pitch-forks, and loaded on the waggon, a woman following with an ell-rake, on the Cotswolds, and with the common wooden rake in the Vale, to collect the droppings.

The price of mowing is 2*s.* per acre.

The barley-stub clover furnishes excellent food for sheep; but they should not be continued upon it more than a month, lest the crop of the next year be injured.

Threshing is performed in the usual way, and generally by the quarter: the price varies from 1*s.* 6*d.* to 2*s.* 6*d.* depending on the abundance of the crop, and manner in which it was harvested.

The dressing and winnowing are pretty generally managed on the Cotswolds by machines, (Dutch fans,) the advantages of which have been so decidedly proved, that every cultivator of any considerable quantity of land is possessed of one. In the Vale, where the spirit of improvement, on account of the comparative smallness of arable farms, is less encouraged, machines of any kind that relate to agriculture are slowly introduced. The old mode of winnowing, therefore, keeps its ground on most farms.

Produce. On the Cotswold, the average crop is about twenty-five bushels per acre; in the southern district, where the lands have a deeper and less rubbly subsoil, somewhat more. On the loamy soils, as in the higher parts of the Vale of Evesham, and the lower Vale of Gloucester, (at Iron Acton, and some neighbouring parishes,) the crops are seldom less than forty bushels on an acre; often more.

The strong clayey soils being unfavourable to barley, are seldom planted with it, except by way of change, and with the view of cleaning the land, and procuring a crop of clover. When, however, the season is favourable, the produce is generally thirty bushels on an acre, and the grain is esteemed superior in quality to that which is raised on lighter soils, for feeding; and though it has a coarser appearance to the eye, some think it preferable, as being stronger, even for malt.

OATS.

Preparation. The wheat stubbles being cleared, either by mowing or breaking with harrows, and carried off the land, oats are sown on one ploughing, and harrowed in.

In some parts of the Vale, they are sown on cold, sour land, newly broken up, to bring it into cultivation; but, in the lower parts, on good conditioned lands, and make a great return, as also in the Forest district.

The sorts are, 1. The Dutch white oat, thin in its skin. 2. A long black oat. These suit poor and shallow soils, are less liable to shed, suffer little injury from bad weather at harvest, and will wait the farmers' leisure for some time, without much inconvenience. 3. Poland and Tartarian oats, mostly sown in the Vale.

Seed. Five bushels on an acre, and always broadcast.

Time. The latter end of February, during the whole month of March; and, in the Vale, as late as April.

Harvest. Oats are mown and harvested as barley.

Produce. From forty to sixty bushels per acre; less on the Hills.

Threshing. From 1s. to 1s. 6*d.* per quarter: the last price chiefly applies to the black and Tartarian oat; the former leaves the husk with difficulty, and the latter so much so, that, without care and labour, a great portion will be left in the straw.

BEANS

Are principally the produce of the clay soils of the Vale, and the crop on which the farmer much depends.

The small Berkshire ticks are sometimes planted on the slopes of the Hills, where the soil is usually more deep and stiff than on the more elevated parts.

Preparation. Whether planted on wheat or barley stubbles, one ploughing only is necessary, and harrowing enough to make the surface smooth. In this ploughing the land is ridged up; and it ought to be done, if possible, before Christmas, that the surface may be mellowed by the frost. On this account, a "stale plough" is preferred, and, if the setting season proves tolerably dry, the whole will be smooth as a garden.

Putting in. Beans are seldom sown broad-cast, but either drilled, or set by hand or line: in the latter case, about ten inches are left between the rows; above Gloucester, the rows run down the ridges; below, across. The setting pins are made to let the bean about two inches into the ground, and the setting is performed by women and children, who will earn from 10*d.* to 14*d.* a day, at 20*d.* a bushel per line, and 16*d.* without.

After the land is set, the holes are filled, either by light harrowing, or bushes fastened to hurdles, and the harrows inverted upon them: the latter mode is much used when the soil is in a dry state, or pulverized by frost.

The drill plough, in a dry season, answers very well, and saves both time and trouble, but does not suit the clinginess of the soil in wet weather, frequently clogging, and not dropping the seed into the furrow.

Sort. If the land is in high condition, a large bean is generally planted; if otherwise, one between that and the Berkshire tick.

Seed. From three to four bushels upon an acre; less by drilling.

Time. As soon after February comes in as the state of the weather will admit, and the land begins to bear the horses and drags. Frosts uncommonly severe may sometimes injure the early planted beans; yet the decided advantage of this mode, makes the farmers anxious to be as early as the season will allow, in spite of the possible injuries that may be sustained; for if the young plants stand the severity of the spring frosts, the crops are sure of being good; and the frosts are seldom so severe as to do injury.

Culture. The beans being planted, and the land bush-harrowed ("healed"), the furrows are opened with a spade, to let off the water that might otherwise collect, and, by being stagnant, would destroy the crop, as far as its baneful influence extended.

Hoeing is the next process, and is performed by men or women: the stalk of the bean being very brittle, and, when once broken, seldom shooting to advantage, great care is required in this business. The first hoeing is begun in the early part of April, or when the bean is about two inches high: the price, 6s. per acre. A second hoeing is useful, both for the purpose of destroying weeds, and earthing up the plants; this, however, though almost essential to a good and clean crop, is neglected by some farmers, sparing of trouble and expence.

Harvest. Beans are cut either with a hook or scythe: the latter has a light frame or "cradle" fixed to the back of the blade, to keep the stalks forward; this is called "cradling," and is done for 7s. an acre. They lie for one day on the ground, as they are left from cutting; after that, if the weather is favourable, they are drawn together with a hook, into small heaps, and tied in sheaves, "hackled," and stacked upright; in which situation they are left for a fortnight or more; and then carried, ricked, and well secured with thatch.

Beans are sometimes cut with a common scythe, a boy following with a pitch-fork, to collect them into small heaps or "wads;" with this management, which is not esteemed a good one, and is seldom used, except when the crops are light, the stalks, not being laid regularly, are not tied up nor hackled, as in the former case, but left loose on the ground, and in that state carried to the mow. Some trouble is saved in binding, but the disadvantages more than balance it, particularly if the weather be catching and the ground damp, for then the beans which lie next to the soil soon begin to shoot, and are spoiled.

The general rule for cutting is, when the pods begin to turn black; if before, they become wrinkled; if left too late, they shed or waste on the ground.

Threshing. A substantial farmer will seldom thresh his beans, till they have been a year in rick: in that time they become sufficiently hard and fit for use, and pay good interest in an advanced price.

The price of threshing is from 1*s.* 4*d.* to 1*s.* 6*d.* per quarter.

Bean straw is used as fodder, or burnt into ashes for the use of the soap-boiler. The latter application of it, is ruinous to the improvement of the lands, which ought to receive the straw back again, in the form of manure. The practice is now considerably abated and discouraged by the landholders, and the manufacturer is so well supplied with foreign alkali, as not to stand in need of it. At home, being first picked over by store cattle, it serves for litter in the stable or yard. The rakings after threshing, which are called "rowens," and the chaff which is separated from the beans in winnowing, both containing some small ones, with broken fragments of stalk and shells, are given to the horses in the stable, and eaten freely by them.

Produce. From twenty to forty bushels per acre.

PEAS.

Preparation. This crop, best suited to light lands, in pretty good condition, generally follows wheat, and has seldom any manure: the greatest quantities are raised on the Hills and sandy lands of the Forest district, or other parts where such kind of soil occurs.

Putting in. Broad-cast, ploughing-in under furrow, or dibbling, are practised; but the advantages of the drill-plough are now so well ascertained, as to be likely to supersede both these methods in every part of the county. From eight to twelve inches distance is left between the rows, and the plough goes down about three inches deep. Two acres may be drilled in a day, with a man, boy, and one horse.

On the Ryelands, where setting by hand is still retained by some, from 10*d*. to 1*s*. per peck is given, with drink.

Sorts. The Burbage pea, (a grey pea,) being an early and productive sort, and useful for the purposes of the farm, is most in use. Some lands have the peculiar quality of raising "siddow" peas, or such as boil freely. On these, the Charlton are principally planted. Clay lands have not this property.

In the vicinity of Gloucester, and other towns, peas are grown in considerable quantities, to be picked green, and the early crops are generally off in time for turnips, or even potatoes.

Seed. In the broad-cast way five bushels are sown, by the drill-plough three, and less with the dibble. The seed is procured from any soils lighter and poorer than that to be planted.

Time. Early in March, or before, particularly on the Hills, Ryelands, and other keen sands, where it is necessary to have the surface covered before the hot weather sets in.

Culture. As soon as weeds appear, they are hoed, except when broad-cast. On the Cotswolds, this is sometimes done with the horse-hoe, but more often with the hand-hoe. In the Vale and Forest district, the latter practice is universal. They are hoed a second time, when the weeds are again cut up, and the earth drawn to the plants. The average price of each hoeing, is about *3s. 6d.* per acre.

Harvest. They are severed from the ground with a hook, by men, who at the same time throw them into small heaps or " wads," in which state they lie, being only now and then turned, till they are fit for carrying, which will be the case in a day or two, if they were well ripened, and the weather is fine. If there is sufficient barn room, they are lodged there directly, because it is usual to thresh them out as soon as is convenient, for the sake of the straw, which is either cut into chaff for the draught horses, or otherways used for food.

Produce. From twenty to forty bushels per acre.

Beans and peas are often sown mixed, (peas being in the greater quantity;) in this way they are called pouse, and it is excellent management, where the crop is intended for fattening pigs; the bean-stalks answer the purpose of supports to keep the peas-haulm hollow from the ground, and consequently from rotting; the pulse also, after threshing, are mixed in good proportion for the use of the stye.

TARES OR VETCHES

Are raised in all parts of the county, and on all soils. On the Cotswolds, they are sown broad-cast, at the rate of two or three bushels per acre; and, if in spring, a little barley or oats is scattered among them, to keep them from the ground. No hoeing or subsequent culture is required, as the plants soon spread thick enough to keep under the growth of weeds. Winter-vetches *(vicia sativa)* are sown in September, and spring-vetches *(vicia lathyroides)* in February, or early in March.

The crops are eaten off, when just in blossom, by sheep, chiefly ewes and lambs, within hurdles, as a preparation for wheat; and if the ground be dry, they are suffered to run over the "hitch" (portion hurdled off) at liberty; but if wet, the vetches are then cut and put in racks. On the slopes of the Cotswolds, they are found, under this management, to be an excellent preparation for turnips. In the Vale, they are sown, or drilled, and generally in autumn, for early spring-food. Rye is here scattered among the seeds, to support the vetches from the ground. In the neighbourhood of Gloucester, the green crops of rye and vetches mixed, are applied in an excellent way. They are cut up, with old dry hay, into chaff; and in this state eagerly eaten by horses; the superabundant juices of the green vegetables, are corrected by the dry hay, and scouring prevented. This method, however, robs the land of its manure, and ought to be followed only where a substitute can easily be procured.

In the higher parts of the Vale, where the land is rich and loamy, vetches are eaten off by horses, which are "hitched" to a peg by the fore leg, and permitted to range only to a limited extent; or they are cut, and laid at the extremity of the circle, just within reach of the horses, to prevent their treading and spoiling. The urine of the horses is considered as highly fertilizing to the land. In consequence, however, of accidents which have happened to horses from fright and struggling to disengage themselves, the practice is declining; and in lieu of it, they are mown green, and carried to the stable to be eaten. In other parts of the Vale, the crops are eaten in the same way: but however disposed of for green food, this kind of crop is particularly useful, as it is ready for cutting at that early season (April) when hay has become short, or nearly expended, and the natural grass scarcely begun to vegetate: and the whole is cleared in good time for barley, and in a state of high preparation for turnips, if the crops have been eaten where they grew.

A crop of tares is sometimes ploughed in for manure, and, from the succulent nature of the stem, answer the purpose; but an intelligent farmer will scarcely adopt this system, except on lands, which, from their situation, are inaccessible to the usual methods of manuring, or of a nature not adapted to folding.

When left for seed, they answer very well in the return of the crop: in this case, they are mown in the usual way, with the common scythe, and repeatedly turned till dry; then carried and stacked, if convenient, without ricking, as the sooner they are threshed the better, both for the supply of seed for the market, and litter for the cattle.

Vetches have one great advantage in the cleansing effect produced on the land; the close and matted manner of their growth render it almost impossible that any other plant can emerge, unless, as is the case, with rye or barley sown with it; but low and trailing weeds are kept under and choaked, with few exceptions. An average crop of tare-seeds is about fifteen bushels, and usually bears the same price as wheat.

TURNIPS.

Preparation. On the Cotswolds, turnips are grown on a spring fallow, or after oats, or on saintfoin-ley pared and burnt; and every possible exertion is made for an abundant manure, on the stubbles.

In the conversion of old saintfoin-ley, or downs, to tillage, it is the practice to breast-plough shallow, and burn; the ashes being found, by experience, to be the best of manures: after these are spread, the land is ploughed, and the seed sown, and lightly harrowed in.

When turnips are sown on oat-stubble, the land is ploughed as soon as the crop is cleared off, and again in spring;* but between the two ploughings the manure is laid on, which is dung from the stable and cattle-yard.† On the sands, the same method is pursued as the last, but the manure is of lime, or yard or fold-dung,

Sorts. The tankard (so called from its form) is now much sown, but will not bear the frost. The white, red, round, and green-top will stand the winter. The Swedish *(ruta baga)*, which is coming into use, is much the most hardy.

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* One of these ploughings should be across; and this is better done the first time, because the land comes into a better form by this practice, than by ploughing across the second time, which perhaps is more general.

† All the dung that can be had, should be laid on the turnip land, because it will have the whole six years to repay that expence, and few arable farms can manure oftener.

Time. The Swedish is sown in May; the other sorts from the 12th to the 30th of June.

Seed—Quantity. From one to two pounds on an acre broad-cast.

Culture. Soon after the seeds are up, a light harrow is often run over the ground; this answers the double purpose of thinning the crop, and loosening the roots of the weeds. They are soon after hoed, but the time depends much on the weather; the proper time is about the latter end of July, when they have arrived at a state not to be injured by the hoe. Price from 7*s.* to 9*s.* The great art of hoeing is to leave the plants properly thinned; the usual distance is nine inches.

Turnips are not only considered as a preparation of the soil for the producing of any corn, but an opinion generally prevails, that it is almost impracticable to obtain even moderate crops of any description without them. The effect depends on the manure with which the land is first dressed, and the subsequent treading and excrements of the sheep, while they are folded on them. By the first, the soil acquires a temporary tenacity; and by the last, a degree of fertility, not soon lost; for the dung of sheep, having more solidity than other animal excretions, incorporates more intimately with the soil, and does not, in consequence of quick diminution or decomposition, sink into the fissures of the subrock.

The tankard turnip is usually sown for the first eating. The Norfolk white-top is the next in succession, and is frequently mixed with the green-top and red: the two latter sorts are esteemed harder, and will bear a greater severity of weather; but the two first, if uninjured by the frost, are preferred by sheep, as is evident from their eating them first when the sorts are mixed.

The Swedish turnip, on account of its hardiness in standing throughout the winter, uninjured by the severest frosts, is coming into estimation in some parts of the county, where the soil is of a good quality; for they require better-conditioned land to support and bring them to perfection, than is to be found on the higher Cotswolds, and are therefore chiefly sown in the Vale. They require to be sown in the beginning of May, because they are slower in their growth, and take more time to arrive at a good size. The same process of hoeing, thinning, &c. is observed as on the Hills; great pains are bestowed on the land, previous to sowing, with plenty of farm-yard manure or lime-compost, to bring it into a condition of vigour.

It has been discovered by a cultivator at Baunton, that the Swedish turnip is peculiarly serviceable to ewes before lambing time. He was induced to give them this food by the hope of saving his lambs, which, in a day or two after they were dropped, frequently fell into a skitt. The ewes had usually been fed with clover and saintfoin-hay; and it occurred to him, that the drying qualities of that food, in the spring months, induced a fever on the dam, and the consequent complaint in the lambs. The mixture of turnips with the hay, keeps the bodies open and cool; and the practice has been attended with continued success. Another consequence is, the increase of manure. The ewes are kept in a fold "yard," well littered with straw, which, by their excrements and treading, is converted into a rich body of dung.

In the eastern part of the lower Vale, on a light red loam, turnips are drilled on one-bout ridges, over long dung, as recommended by Mr. Close. This is at least the practice approved and followed by Mr. Ludlow, on a large farm at Winterbourn.

On the sandy soils of the Forest district, properly called the Ryelands, fine crops of turnips are grown: the soil is perfectly congenial to their nature; but the quick evaporation, or loss of moisture, renders the seed liable to be injured or lost in the ground from dry weather; if, however, some rain falls for a few days after sowing, there is no danger of a failure; the vegetation being rapid, they are soon beyond reach of the fly.

Application. Turnips on the Hills are fed off with sheep folding; and one ton of hay is usually allowed to every acre, to be eaten with them. In this expenditure of turnips, the beginning is made at the lowest part of the field, and a new portion, or "hitch," is allowed every day, still gradually rising. If intended as a preparation for barley, the crop should be cleared off by the middle of April at farthest, that there may be sufficient time for working the land.

In the Vale, on the clay soils, the turnips are drawn and carried to the stall, and eaten with hay and other dry food.

On the Ryelands, the early turnip is often sown in June for the market, and the ground cleared time enough for wheat to be put in before Christmas. This is a substitute for a summer fallow, and, when the land has been previously well cultivated and manured, succeeds very well.

The great enemies of the turnip-crop, are the fly and slug: the latter probably is the worst, the mischief being generally done in the night when the slug is on its food. The following management is recommended by an intelligent farmer.

On the first appearance of the turnip beginning to suffer by the insect, sow about four bushels of soot per acre, while the dew is on the ground. This operation should be performed about two in the morning, and, if thoroughly done, will check the progress of the mischief, if not entirely prevent it. The reason is obvious: soot contains a principle so bitter and caustic, as to be disagreeable, at least, if not noxious, to most animals: so long, therefore, as the virtue of it lasts, so long its preservative effects are continued on the surface, and probably are not lost, when, by rain, it is washed into the earth; however, if this happens before the turnip comes into rough leaf, the operation would better be renewed.

Vagg's method is not much adopted, though the farmers are ready to allow it to be likely to do good. One had found a decided advantage from the trial once, but had not repeated it. The trouble of keeping labourers to work during the night, is probably the great objection.

After all, perhaps, one of the best methods of prevention is, to keep the land in good heart by manure and cultivation, so as to force a quick vegetation, and the early production of rough leaves; this plant being liable to the attack only while it is young, and the leaves tender.

Turnips, however, on which so much depends on a Cotswold farm, being, in spite of the best management, a precarious crop, the following plan has been recommended to prevent a total disappointment, in case of their failure. Let one-third part of the land intended for turnips, be sown with peas or oats, and let the whole be eaten on the land, as if it had been sown with turnips; that is, thresh out the corn, cut up the straw, and give the whole to be eaten on the land where it grew, by folded sheep, which perhaps would improve the soil more than if the whole had been in turnips. In this case, the land certainly raises its own manure, and leaves a saving of that from the yard for the turnip land; these crops will also suit the stiffer soils, which are not so proper or certain for turnips.

Where the principal mischief is apprehended from the slug, the same expedient might be adopted, with good prospect of success, as is found to answer with flax. See chap. 7. sect. 5.

The Cotswold farmers are not agreed as to the quality of nourishment afforded by turnips, nor have experiments been made to ascertain it.* It is the opinion of many, that they have no feeding qualities in themselves, and that if sheep and other cattle are put upon them in low condition, they will merely not sink or lose ground. The general practice of giving hay with them, in the proportion before stated, shews that they are considered, either as a food, too watery of themselves to be safe, or not nutritious enough to fatten. A ton of hay should nearly of itself finish six or eight sheep, if already forward; and this being the allowance to an acre, little dependance seems to rest on the turnips; but the great advantages which the farmer looks forward to, are the improvement of a light and poor soil, by the manure and treading of the sheep; and, without these, his land is of little value.

A cultivator of Turkdean, who has been all his life employed on Cotswold farms, thinks, that the nutritious qualities of turnips are such as to increase wool and carcase, but not to produce fat; and that, while sheep are on this food, they should be allowed as much hay as they can eat without wasting it.

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* A score of middling sized sheep may be kept on an acre for three months.

RYE

Is the produce of that part of the Forest district, including Newent, Pauntley, Oxenhall, Dimock, and Bromesberrow; hence called the Ryelands. The soil of this portion of the county, is divided into keen sand, and clay, with a middle sort, called bastard land. Rye is sown only on the first, but not exclusively of other seeds, except beans. On the second, cone wheat, with the usual management of the same kind of soil in the Vale; and, on the third, red lammas, barley, peas, turnips, clover. The nature of the bastard land, suits any crops; but it is an invariable rule not to plant beans on the sands, nor rye on the clays. The quantity of rye now raised, even on the sands, is comparatively trifling, it having been found that wheat, by the aid of lime or other manure, may be grown on the same lands; and, though the crops are not so abundant as on stronger soils, yet more useful and advantageous than rye. This grain, in a short time, will probably be raised only for spring feeding.

The state of the land is not considered for this crop; and therefore it is generally the last in rotation, when the heart has been broken down by previous crops. It is a proverbial saying, that the poorest land will bear rye.

It is sown at the beginning of winter, at the rate of two bushels to the acre. If they are designed for spring feeding, three bushels are sown: the crop is then sometimes eaten off entirely, and followed with turnips; or not eaten close down, and left to grow for seed. In the latter case, it is followed by a fallow, as a preparation for wheat, barley, or turnips. The management is nearly the same as wheat, but, ripening much earlier, it is commonly harvested by the middle of July.

SIBERIAN BARLEY.

This species has been cultivated on the eastern part of the county, but not on any large scale. The time of sowing, quantity of seed, and produce, differ little from the common sorts. The weight is said to be about eight pounds more by the bushel, arising probably from the uncommon thinness of the husk. The straw is short, and the grain in colour like rye: it ripens rather earlier than common barley. As food, it has been tried on pigs, but, being of a rich nature, like wheat flour, soon cloys them. Malt, of a powerful quality, is made from it; but the maltsters being unacquainted with the kind, the grower was obliged to discontinue the raising of it, or apply it only to the purposes of the farm.

SIBERIAN OATS

Have also been sown by the same grower, and found as much superior to the common black oat, as the Poland is to others. Its advantages are, that it may safely be planted in December, and will be fit to cut as soon, or sooner, than early peas; the produce is greater than the usual sorts; and rain, instead of injuring, rather improves the colour, which is pied. The kernel is large, and the straw makes excellent fodder.

The grower discontinued the raising of it, because he had little land adapted to oats, and found considerable inconvenience from their mixing with the barley, which constituted the principal crops of his farm. They are now much sown in the lower part of the Vale.

POTATOES.

Potatoes are planted, more or less, on every farm, but, in the southern parts of the county, are more an object of attention, and cultivated in a better manner than elsewhere.

Preparation. Old pasture ground is preferred; and this is dug neatly into beds of half a " lug," or perch, wide, about the beginning of March: the turf is cut up with the spade, to the depth of seven or eight inches, turned over with the sod downward, and the new surface is lightly loosened, or skimmed, with the spade, to produce a small depth of mould, provincially " cutting a cotton." Early in April, the setting begins, and continues through May.

Sorts. Every year almost brings new varieties. The present favourites are the flat whites, white blow, white early yams, the ox-noble, magpye, and purple eye. The magpye is remarkable for keeping well, for, if well-managed, they will be perfectly good some time after new potatoes have come into use.

Planting. Either small potatoes, or large ones, cut into " sets," each having two eyes at least, are planted. From eight to ten sacks are set on an acre, each sack containing twelve common pecks: they are planted across the beds with a pin or dibble, in rows of fourteen or sixteen inches apart, and six inches distant in the rows.

Culture. Before the potatoes come up, a light harrow is drawn by two men over the ground, both for the purpose of gently moving the surface soil, and disturbing the weeds, which usually start before the shoots of the potatoes. When the plants are two or three inches high, they are hoed ("flat hacked"). After this, they are hand-weeded, if the land should be foul, but not hoed again. In a little time the potatoe-haulms grow high enough to keep under all weeds, and require no farther care till they are ripe.

Taking up. When the haulms begin to wither, they are considered as fit for taking up; and this is done by digging, not usually by the quantity, but by the lug. As they are dug, they are distributed into three sorts: First, marketable potatoes; secondly, seed, about the size of a pullet's egg; thirdly, a smaller size ("trash"), for the pigs. In fine weather, they are left on the ground during the day, to dry.

Produce. One hundred and fifty sacks (of three bushels each) are not uncommonly raised on an acre of good old broken up ley: from eighty to a hundred are reckoned an average crop.

This is the practice at Iron Acton, and a similar one is pursued in all the district where old pasture is broken up; but where land already in tillage is used, there is some variation.

In this case, half-rotten dung is distributed over the land (generally on barley stubble), about twenty cart ("pots") loads to an acre: the whole is then dug into beds of the same dimensions as before, planted and managed in the same way.

At Wickwar, the land is usually ploughed and laid even with drags: then drills are made the whole length of the field, in which the sets are planted. A little "muck," or half-rotten litter, is scattered by hand over them, and then the mould on each side is drawn over; and this last operation is repeated at proper intervals, till the ridge, in which the plants are growing, is raised almost knee high. The crop is dug out with forks, having four flat prongs, and generally by the day.

This is esteemed a superior method, and more productive than any other; the crop being equal almost to those which are raised on old leys, and it is attended with less expence, particularly in the price of land, and preparation for planting.

At Cold Aston, in the neighbourhood of Bath, a peculiar degree of neatness is preserved in the potatoe grounds; the whole having the appearance of a well managed garden. The practice here is the same as at Wickwar, with this difference only, that instead of half-rotten litter, very fine old mouldering dung is sprinkled by hand over the sets in the drill. The soil is a rich, red loam; and it is said that the same land has been planted with potatoes every year almost since their introduction into the country. Still the produce is abundant, and the quality remarkably fine. They are chiefly carried to the Bath market.

At Winterbourn the land is ploughed, and the sets dropped into the furrows, and the crop is ploughed out again. The soil here is a keen red sand, and therefore the process is easy, though it is not reckoned a good practice. It is found to answer better, if the sets are planted on every third furrow. A respectable cultivator at Withington, planted four acres in this way in 1799, which returned him nearly fifty pounds an acre. Instead of hoeing, he used a small plough of his own construction, made in imitation of the Scotch, with which he first threw the mould from the plants, when the weeds began to appear; and when they again sprouted, threw the furrows back, which completely answered the purpose of two mouldings, at a little trouble and expence. His example and success has introduced the practice of potatoe planting, on that part of the Cotswolds, to a considerable extent.

Preserving. On a farm well covered with buildings, the potatoes are kept in houses. The inside walls are lined with turf: coal ashes are strewed at bottom, to the depth of six inches: on this the potatoes are piled, and covered at last with another laying of ashes of the same thickness. Where ashes are plentiful, they are mixed throughout the heap. By this management, all exuding moisture is absorbed, and the potatoes are seldom found to "start" or sprout. Where ashes are not to be had, dry sand will answer the same purpose.

If there is no convenience of building, they are "pitted." The surface of the ground on a dry spot is skimmed off to an extent proportioned to the quantity intended to be preserved: loose earth is laid at bottom, and on this the potatoes are stacked, five or six feet high, then covered on all sides with straw. After this, mould collected from the sides is thrown over to a considerable thickness, and the top is finished like the ridge of a house. Those who are particularly careful, cover these heaps with a coating of thatch, which adds to the neatness of appearance, keeps the covering mould from being disturbed by frost, and effectually excludes all moisture. A channel of some depth is formed on the sides, by the digging out of the earth, which carries off superfluous water, and keeps the bottom of the pit well drained and dry.

The necessity of renewing these pits every year, is an objection to their utility. An improved and permanent plan has been adopted in the neighbourhood of Gloucester. The soil is thrown out in the same manner as for pitting, to the depth of two feet, and about six feet wide: on the edges of this pit rafters, of eight or ten feet long, are raised, which meet at the top ridgeways. Upon these, slabs, refuse of board, &c. are laid and fastened, so as to form a close floor for a covering of mould, which is taken from what was dug out, and regularly continued from bottom to top on each side, to the thickness of a foot or more, and over this a good coat of stubble thatch is laid, which is occasionally repeated, till the whole covering has attained the thickness of three feet or more. If the rafters are placed pretty near to each other, peas-haulm, potatoe-stalks, &c. will, in an inferior degree, answer the purpose of boards. A door is made at one end, which, in frosty weather, is guarded with turf and straw from the admission of the external air. A house thus constructed is effectually secured from frost or damp; and, during summer, answers the purpose of a garden house, or depositary of baskets, tools, &c. The first expence and loss of ground are the only objections to this method; but the expence is not repeated, and the loss of ground is well compensated by the convenience of it, as a store-house in the summer.

Potatoes are allowed to be an exhausting crop, and therefore require continual supplies of manure on lands already in tillage. On new broken leys, they are an excellent preparing crop for wheat; they mellow the sod, and lower the soil to a proper degree of strength, which would otherwise make the wheat stalks rank and lodged. Old pastures let from five to eight guineas per acre in the district we have been chiefly considering, for potatoe planting; yet, under good management, the returns are profitable, as will be seen by the following calculation.

DEBTOR.	£.	s.	d.
Rent of an acre of old ley - - - -	8	8	0
Digging, at 4*d* per perch - - - -	2	13	4
Setting - - - - - - - -	0	3	0
Hoeing and weeding - - - - -	0	8	0
Seed, 9 sacks, of 12 pecks each - -	2	14	0
Digging out and sorting, at 4*d*. per perch -	2	13	4
Tythe, at 8*s*. per acre - - - -	0	8	0
Taxes - - - - - - -	1	4	0
Expences of housing, &c. paid by seed and trash - - - - - - - -	0	0	0
Total expences	18	11	8
Profit	11	8	4
	30	0	0

CREDITOR.	£.	s.	d.
One hundred sacks of marketable potatoes, at 6*s*. per sack - - - - - -	30	0	0

In this estimate, the crop is valued at the price they are worth immediately from the ground: where, however, they are pitted, and kept till the latter end of the season, the price is from 8*s*. to 10*s*. per sack.

The curled potatoe, which used to be so troublesome to the planter, is now seldom seen; this is supposed to be owing to the change of seed, and introduction of new sorts from the northern parts of the island, and elsewhere.

OBSERVATIONS.

Though the county has been distributed into three districts, for the purpose of this survey; yet there are some passages of land, to which the mode of husbandry in neither of those districts will apply. A considerable exception, or rather variation, of this sort, occurs in the lower part of the Vale, comprehending the parishes of Iron Acton, Frampton Cotterel, Winterbourn, &c.

Soil. The soil of this district is a red sandy loam, provincially "tile grit," generally shallow, and lying on an horizontal subrock of red grit stone, which in some places separates into a thick tile, in others to a fine paving stone, proof against the changes of the atmosphere. Iron ore is found in considerable plenty.

Rotation of crops. The land is kept "two years up and two years down." When broken up from the clover ley, wheat is sown, then barley, with seeds. This course is seldom interrupted, except occasionally by a crop of potatoes before the wheat, and, where the soil is more loamy, oats instead of barley before clover.

WHEAT.

Preparation. The ley which has stood two years, is Ploughed once about Michaelmas, and the seed sown without manure; if broad-cast, two bushels and a half per acre; if drilled, six pecks. The seed is often drilled by hand: women make channels with the hoe, across the beds, which have been formed by the plough to the width of half a lug, and drop the seed into them, leaving a distance of about seven inches between each channel: this is esteemed a good method, particularly for late work. The expence is about 7s. per acre, and the quantity of seed used about six pecks.

Crops, whether drilled by hand or with the plough, are always hoed in the spring, and afterwards occasionally cleaned with the paddle. On the broad-cast, a harrow is sometimes drawn over in spring, and afterwards a heavy roll; but unless it be very foul, which is seldom the case, the hoe is not used: the weeds are cut up, as occasion requires, with the paddle or weeding hook.

The harvesting is nearly as in other places, except that a shorter stubble is left on the ground: women bind and put into stucks, or "tythings," of ten sheaves. If the weather be stormy and catching, the sheaves are stacked up into "pucks," or cocks, about the size of the hay windcock, in the field, and there left till it is convenient or safe to carry them.

Reaping, binding, and stucking, 8s. per acre, with six quarts of drink to each man.

Average crop, thirty bushels; and some good lands forty.

TURNIPS.

If the harvest happens to be early, and weather favourable, the land is ploughed immediately after the wheat is carried, and turnips sown: these are called stubble turnips. The sorts are the early Dutch and Norfolk, and the crop is frequently abundant: they are eaten off by sheep folded during the winter, and followed with barley.

BARLEY.

If no turnips have been sown, the rank weeds or grass on the stubble are first eaten close down; then the land ploughed before Christmas: in February it is crossed, dragged, and rolled, to pulverize it; the couch or quick grass is picked by hand, put into heaps and burnt; the ashes are spread, and, before the next ploughing, a dressing of lime-compost is given. This manure is carried from the heap in carts ("pots,") and dispersed as the pot moves slowly on, by a man with a wide shovel. The land is then lightly ploughed and dragged across; the seed is sown at the rate of four bushels to an acre, and harrowed in. After this, the seeds are sown in the following proportions: If intended for feeding, half a bushel of ray-grass, five pounds of honey-suckle, and eight pounds of hop-clover. For hay, half a bushel of ray-grass, ten pounds of broad, and five of hop-clover.

Broad clover is not sown for feeding, because it is said to become bitter towards the last; and some are of opinion, that ray-grass would be better omitted for hay, as being coarse, and not nutritious, when dry. This opinion, perhaps, arises from the custom of cutting it late; for the quick growth of the ray makes it fit for the scythe before the other seeds, and therefore the delay is the effect of necessity; in this case, it would be better to leave it out.

If the land is not quite clean after the seeds have been sown, it is again couched, and the filth collected into heaps, and burnt as before, with a smothering fire. The seeds immediately under the heaps are necessarily destroyed by the heat; to remedy which, after the ashes have been scattered, the rake is drawn round to the spot, or a few fresh seeds sown. This appears to be a wasteful practice, and is pursued merely to save the little trouble of removing the collected couch to a separate spot or corner of the field.

The barley is mown in the usual way, at the rate of 2*s.* per acre, and six quarts of drink. Four quarters are reckoned the average crop. It is cocked with large wooden forks, which get up the work so fast that two women are kept employed in raking after one man. When sufficiently dry, it is put into large mows, and, at a proper season, threshed out at 3*d.* per bushel, and drink. On winnowing, which is included in the threshing, a dinner or supper is allowed. The straw is given to dry cows and young beasts.

Clover. First year, mow and sometimes seed; the best practice, however, is allowed to be, to feed off the aftermath. Second year, feed off with sheep, or mow as early as possible, and then plough up, manure, and turnip, between new and old Midsummer-day. These turnips are fed, or sold off, for the market, time enough to receive the wheat crop. Price of mowing clover or grass, 2*s*. per acre, with dinner; or 3*s*. 6*d*. with drink only.

Manure. Fold yard, or "barton" dung, is always used when there is a sufficient supply: this is made during winter from the cattle at straw, or feeding beasts. In the spring it is collected in heaps, carried out, and put together; this is never mixed with lime.

Lime-compost is managed in the following manner: A length of land, commonly near the hedge, or on the side of the highway, is ploughed up, and the mould thrown into a high ridge; along the middle of this, a channel is drawn, and lime fresh from the kiln is deposited in it, and covered a foot thick with the side earth. When the lime has lain long enough to be half slaked, the whole is turned and mixed; and usually a second time, after it is perfectly slaked, when it is fit for use. A hundred bushels, at 3*d*. per bushel, at the kiln, are allowed to an acre.

Another kind of manure is made in this district from straw, potatoe-haulm, &c. laid on the roads, and there trodden to pieces: the whole is afterwards scraped together, laid in a heap, and occasionally turned, till it is rotten; then used as a covering to the lime in the ridge, before the mould is thrown on.

The old one-wheeled-plough has long been established in this district, but is likely to be superseded by the Beverstone, which is found to suit this soil, when clear from stones, better than any other.

Prices. Honey-suckle 1*s.* per pound. Milled hop 7*d.* and broad clover 6*d.* Ray-grass, 6*s.* per bushel. Ploughing, 12*s.* per acre. Coal, 4½*d.* per bushel at the pit. Labourers wages, 2*s.* per day, and drink. At harvest, 2*s.* 6*d.* with victuals and drink.

Another exception to the general practice of the county, occurs in the tillage-lands immediately around Gloucester, and a few other places, where a crop is raised every year, and thence called every year's land. The high renting of land near the city, obliges the farmer to keep it in continual cultivation: and where the soil is sandy or loamy, it is very clean, but otherwise on that which is more stiff. The greater part, indeed, being applied to gardening, is managed with the spade, and kept in high condition, and free from weeds. There is no regularity in the succession of crops; care only being taken that two white straws do not follow each other. Peas for early gathering are much planted, and are generally off in good time for potatoes or turnips.

In the parish of Deerhurst, the soil is a deep red loam, and so rich that it scarcely requires manure. A fallow is not known, and yet the land is kept perfectly clean from weeds; the crops are strong and abundant, and the whole management reflects much credit on the knowledge and attention of the cultivators.*

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* In walking over the tillage lands of this parish, the present year (July 17, 1805,) the wheat stalks were seldom less than six feet high, and proportionably strong and well headed. The beans still higher, and well hung with pods, as well as more free from blight than others which I had seen.

The general manure is stable-yard or court-dung, mixed in compost with earth; and the rotation of crops, is wheat on clover-ley; then beans; then barley; next beans again, or peas, if the land be foul, or sometimes vetches, most commonly for green fodder, the pasture and meadow land being equally fertile, and supplying abundance of hay for winter consumption. The broadcast husbandry prevails, and beans and peas are dibbled in the common way.

In Apperley (a tything of this parish) is a common of more than 200 acres, which would be productive of great utility if inclosed; at present a few sheep, and geese in abundance, are the principal stock. It is subject to be inundated on every small rise of the Severn; this, however, under proper management, might be prevented, or turned to advantage.

Marl forms the substratum of nearly the whole of this parish, though it is not used for manure, but for covering to the courts, instead of stones; for which purpose, it is excellently adapted: thus, however, the farmer, without suspecting it, carries a considerable portion off with the dung, every time it is scraped and collected together.

SECT. V.—CROPS NOT COMMONLY CULTIVATED.

FLAX.

An inconsiderable quantity of flax is now grown in the county, though, a few years since, it was much otherwise in the Vale of Evesham. From an opinion that the land was impoverished by the growth of it, it has been in a great measure discontinued, and the tenants restricted in their leases. There seems to be no question as to the fact of impoverishment, since no part of the produce is left in or on the ground, or consumed out of it, so as to be brought back again in the form of manure; and experience proves the necessity of recruiting, by some means or other, the vegetating powers which have been exhausted. As a first crop on the breaking up of old leys, it is, if not unobjectionable, at least preferable either to paring and burning on strong soils, or planting wheat. In paring and burning, there is a waste in the thickly matted turf of the Vale lands: and in planting wheat, the hopes of the harvest are often destroyed by grubs, which are sheltered and nourished in the roots of the grass and weeds; whereas the root of flax is said to be seldom injured by insects under ground. As a preparation, therefore, for wheat on strong lands, (and on these only can flax be planted with advantage,) it is useful, and, like potatoes, which are equally exhausting, employs the land profitably, while the sod is rotting; but where crops of flax are repeated, it is necessary to dress the land with good manure: the little, however, which is grown in this county, is usually sown on fresh-broken pasture in the Vale; or, where it is not, the cultivator contrives to bring on the estate an equal quantity of substitute to what is lost by this crop, either of road or street scrapings, or other artificial composts.

Preparation. The land is ploughed in the common way once, and the turf being turned regularly with the grass downwards, the new surface is harrowed fine, and freed from clods and apertures.

Seed. Two bushels are sown on an acre broad-cast, and lightly buried with the harrow. That directly from Riga is preferred; and this is considered as improper to be repeated more than four times. Fresh imported

Riga seed is worth 18*s.* per bushel; common seed, or the produce of England, 8*s.*

Time. The last fortnight in March, or first week in April.

Culture. The growing plants are kept perfectly clean from weeds, and this is usually done with the hand by women on their knees. Soon after the flax is up, it is liable to be injured, and even destroyed, by an insect like a flea, and a grub of a dun colour, about three quarters of an inch long: the former eats the leaves; the latter eats off the stalk close to the surface of the ground. Against the ravages of the flea, no preventatives are applied; but to stop the progress of the grub, it is found to be a good practice, to turn into the field, at night, a large quantity of *young* ducks, which will search for these insects with great regularity, without doing mischief to the tender plants. The same management might probably be used with success among turnips. Rooks are often useful for the same purpose: if they happen to discover these grubs, they will destroy all, or the greatest part of them, and are therefore encouraged near such plantations.

Harvest. About the beginning of August, the stalks, if the season and other circumstances have been favourable, will have grown to the height of three feet, or something more, when they are drawn by hand, at the rate of 4*s.* or 5*s.* an acre, and laid on the ground, where they remain, till dry; after which they are "stelched," or put upright in stacks, leaning against each other, and covered at top with loose stalks, to keep off the rain. Having thus stood a proper time, they are bound, and left some time longer in stucks, like wheat: then carried to the barn, where the seed is got out with the beater, (an instrument in the form of a washer's beetle,) about a foot long and seven inches wide, with a long handle. The straw is then tied up again, and taken to the grass grounds, where it is spread to bleach. After having been again stelched, it is carried to the barn, where it is "swindled," "hatchelled," &c. As the crops are generally sold to the manufacturer, the drawing the stalks, and all the subsequent processes, belong to, and are paid for by him. The price of an acre is, according to its goodness, from 10*l.* to 20*l.*

The straw is esteemed better for the use of the manufacturer, if drawn before the seeds are quite ripened; but as an average crop will turn out ten bushels or more, worth from 4*l.* to 5*l.* the stalks are seldom drawn till the seeds are ripe.

Flax plants are frequently annoyed by with-wind *(convolvulus arvensis)*, and dodder *(cuscuta europæa)*.

HEMP

Is seldom raised in the county.

RAPE AND CABBAGES

Are grown by very few, and that in small quantities, for the purpose of food for cattle. In this respect, the farmers of Gloucestershire neglect an important article of agricultural produce, as the strong lands of the Vale are well adapted to the production of both. Experience, in other counties, has proved the great advantage of such crops, not only as increasing the quantity of food,* but also as an useful change in the rotation of crops: the system of the Vale, however, is at present adverse to their introduction.

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* No food is equal to rape, if fed off at the latter end of August and September, for finishing fat sheep; or, if they cannot be made out by that time, it will thicken their coats, and make them fleshy for market.

TEASLES

Were formerly much cultivated in the middle Vale, as appears by the mention made of them in the ancient tythe terriers; but now not a hundred acres are planted in the county.

Preparation. Old leys are preferred; they will, however, grow on the same land for many successive years, so long as couch and other weeds can be kept under; and during all this time manure is said not to be required.

Old pasture lands are once ploughed, and on the inverted sod the seeds are sown broad-cast: they are brushed in with thorns fastened to a hurdle, because the tines of the harrow would let in the seed too deep.

The same preparation is used on old tillage lands, except where more ploughings are required to make them clean.

Seed. From two to three pecks upon an acre. A sufficient quantity is easily collected from the plants when ripe and dry, as they shed upon the slightest motion. When a farmer first begins to plant any part of his estate, he purchases them of a neighbouring grower, and the price is usually the same which wheat bears at the time.

Time. About the middle of March, or within a a week after ploughing, according to the season; but sowing is not esteemed favourable, after the beginning of April.

Cultivation. When the plants are come into large leaf, they are thinned to about twelve inches distance; and those which are drawn, may be transplanted to fill up intervals in the same ground, or on any other plantation. About the beginning of June, in the first year, they are "spittled;" that is, the workman, with a "shoe," or small spade, turns over the surface-mould carefully between every plant. About two months after, they are "grited;" that is, the mould is turned up four or five inches under, and thrown to the plants; if the land is filthy, the same operation is repeated about October, and the mould brought close round the roots with the common hoe. In the March following, they are again grited, and sometimes "tumped," or moulded, close round, to make them "haddle" out, or throw forth side-shoots.

Spittling generally costs a guinea and a half an acre; and griting, 25s. with drink.

Harvesting. About the latter end of July, or early in August, they begin to ripen, and then are cut in the following manner. First, the central shoot of each plant, called the King, is cut with a small hooked instrument, like a pruning knife, which has a string run through the handle, for the purpose of hanging it on the wrist, when, as it often happens, it is necessary to strip off the leaves. They are cut with about nine inches of stem, and, being tied round a stick, are carried directly from the field to the drying shed, which is a building well covered, but open on the sides to the free circulation of air. About nine days after, the cutter goes over them again, taking off such as are ripe, and repeats the operation at the same interval, as long as any remain worth cutting. After they have been properly dried, which will probably be in a fortnight, they are taken off the stick, and sorted.

The produce of the second and subsequent cuttings are sorted, according to their size, into Queens, which are the best teasles; Middlings, next in value; and Scrubs, which are but little esteemed, except in years of scarcity, or when the clothing trade is unusually brisk. The Kings, which are large and coarse, are generally sent into Yorkshire, to be used on cloths of coarse texture.

Being thus sorted, they are tied up in bunches, or "glens," each glen containing twenty teasles. Twenty-five glens are fastened on a staff, and forty staffs make a pack, which thus contains twenty thousand teasles. Of Kings, a glen contains only ten; a staff thirty glens; and a pack thirty staffs, making nine thousand.

In this state they are stacked, in a close building, in the form of a small rick; and, if they sweat a little, the quality and smell are improved; but if they are too moist, they are spoiled. In the following March, they are fit for sale, and the average price of Queens per pack may be fixed at five pounds; they have been sold as high as twelve guineas.

Produce. Ten packs upon an acre are esteemed a fair crop, though they have been known to rise to twenty.

The teasle *(dipsacus fullonum)* is a biennial plant; those which "run," or bear heads the second year, immediately die; but there are always some which do not run, till the third year; these are called "vores." To supply the place of those that have run, it is usual to transplant young ones from other beds; or, if it be intended to keep the land several years in teasles, fresh seeds are sown in the vacant spaces; and thus the ground is constantly replenished, and produces successive crops, without exhibiting any signs of diminution in point of strength, or wanting manure: manure, indeed, is esteemed injurious, as running the plants too much to stalk, and less to head. There is now a field in the parish of Eastington, seven miles below Gloucester, which has borne this crop for more than twenty years without change; it would, however, now be good husbandry to plough it up, and give it a year's fallow, for the purpose of destroying the couch, &c. with which it is overrun.

Teasles, when sown on an old ley, and continued only for two or three years, are an excellent preparation for wheat: the rotting sod, on which it is always improper to put wheat, on account of the grubs and insects which harbour in the roots, gradually reduces the soil to a state of great richness; and the necessity of keeping it clean during the three years, leaves it in a fine state of cultivation.

The fly, and too much moisture, are the principal enemies of this plant: the former sometimes attacks the young leaves, but seldom with such mischievous effects as to turnips.

Much rain during the time of blossoming, often rots the head; this, indeed, is what the planter has most to fear, as likely to be materially injurious to his crops.

The operations of cutting, &c. are usually performed by day labourers; sometimes, which is more desirable, by men, who undertake to cut, dry, and make fit for sale, at 10s. per pack, with drink, carriage excepted:

CALCULATION ON AN ACRE.

DEBTOR.	£.	s.	d.
Rent of land for two years - - -	3	0	0
One ploughing - - - - - -	0	15	0
Spittling once - - - - - -	1	11	6
Griting three times - - - - -	3	15	0
Seed and sowing - - - - - -	0	10	0
Cutting, drying, &c. at 10s. per pack and drink, ten packs of good teasles - - -	6	5	0

	£.	s.	d.
Tythe - - - - - - - -	0	8	0
Taxes for two years - - - - - -	0	9	0
Miscellaneous expences of carrying from the field, and to the manufacturer - - -	1	1	0
Total expences	17	14	6
Profit on two years	32	5	6
	50	0	0

CREDITOR.

Ten packs - - - - - - -	50	0	0

The drilling system seems capable of being applied with great advantage in the cultivation of teasles. An acre contains 43,560 square feet, consequently would grow as many plants. Supposing every plant to carry ten good heads, which is a low calculation, the produce would be 435,600, or twenty-one packs and a half. On the broad-cast plan, this regularity cannot be obtained; but if drills were drawn, either down or across the ridges, and the seeds thinly scattered in them, they might afterwards be hoed out, or drawn for transplanting to their measured distance; besides that the trouble of spittling and griting would be considerably reduced, and also the inconvenience lessened of going among them to cut and collect.

Considering the high value of a crop of teasles, it is a little surprising that, among the great quantity of old, sour, or worn out pastures, in the middle and lower Vale, so little should be converted to this purpose. Many thousand acres would be improved by breaking up, and, for the first two years, would be advantageously employed in raising teasles, and supplying an article for the use of the manufactures in the county, which is now purchased at distant places. By this management also, the great object of increasing the stock of bread-corn would be attended to.

CORN WEEDS.

The weeds which principally infest tillage lands, are charlock, May-weed, dodder, corn-mint, common poppy, common mild persicaria, hairough, horsetail, field crow-foot, melilot, couch-grass, common thistle, corn convolvulus, wild oat, blue-bonnet, colts-foot, chick-weed.

Charlock. *(Sinapis).* This is the most common weed in the Vale: during the summer, both on the fallows and in the planted fields, its yellow blossoms predominate over every other plant, and, unless destroyed in this state, leaves an immense crop of seeds behind. To check the increase of this weed, the attentive farmer suffers it to come into blossom on the fallows, and then turns it in with the plough. This is not always effectual; for frequently the plants being merely moved, but not from the roots, and having two or three inches above ground, soon recover the damage they have sustained, and go on to seed before the next ploughing. Women or children should go over the land with the hoe a few days after, and cut up the reviving plants; or lambs should be kept on the fallows, which are said to eat off the tops with avidity. In the planted fields they are hoed up, and, as some will unavoidably escape, women are sent in among the corn, after it is grown to a considerable height, to pull out the weeds in blossom with the hand. Though the farmer will certainly diminish the quantity, and prevent any new accession by this attention, yet many years of good husbandry must elapse, before the ill effects arising from the negligence of former cultivators can be conquered; for this seed, being strongly charged with essential oil, will continue in the ground for an incalculable period of time uninjured, and, as often as the soil is turned up, a quantity will be brought sufficiently within the influence of the atmosphere to vegetate. In 1804, I saw, in the parish of Brockthrop, a considerable portion of land in the common field, completely covered with this weed, and the seeds perfectly ripe, and shattering on the ground. The ploughing had been neglected till nearly the autumn; and as the land was not cropped, the charlock grew in great abundance, and left more seeds than the good husbandry of half a century will eradicate.

An agricultural writer has observed, that what is vulgarly called charlock in the Vale of Gloucester, is really the common mustard *(sinapis nigra)*, cultivated in the north for its flour. It is often here collected by the country people for the same purpose; and before the simple mode of living among the ancient farmers fell into disuse, few farm-houses were without a cannon ball and bowl, in which the mustard seeds were bruised, and the flour saved for the table, with the black husks unseparated from it. The lands in the neighbourhood of Tewkesbury were probably much employed in raising mustard-seed in ancient times, as well as other parts of the Vale; and hence the proverbial expression.

May-weed, maithe, or mathern *(anthemis cotula)*, often overruns a whole field, particularly when planted with peas, so that only the white blossom of the weed is to be seen. The only chance of destroying this stinking weed, is by the drill husbandy, where room is left for the free use of the hoe. In the broad-cast way, they must be hand pulled; and this is not only a tedious work, but also in some respects dangerous, for there is a quality in the plant so noxious, that it will often poison the hands of the weeders, particularly if there be any scratch or slight wound already upon them.

Dodder *(cuscuta europæa)* is a great enemy to beans, vetches, and some other plants, but is never seen among wheat, barley, or oats. As soon as it has fixed on the plant, it separates from the root, and, like other parasitical weeds, draws all its nourishment from the plant it has embraced. Large quantities of beans are often ruined completely by it, so as not to carry a single pod; and no method has yet been discovered to destroy it; for though the root cannot be found, yet it surely returns in some part of the field, where it has once begun to grow, whenever the plants on which it feeds, form the crop of the season.

Corn-mint *(mentha arvensis)* is a common weed on damp soils, and increases fast by root, where, for want of frequent ploughing and dragging, it is neglected.

Poppy *(papaver rhæas)* is common in all light and sandy soils, particularly in the neighbourhood of Gloucester. Since the practice of hoeing has become general, this weed has much diminished in quantity.

Common mild persicaria *(polygonum persicaria)* is chiefly found in moist clay lands, on the sides of ditches most frequent.

Hairough, "hairiff," cleavers *(galium aparine)*, is a troublesome and frequent weed among corn on all soils, and not easily destroyed.

Corn-horsetail *(equisetum arvense)* is found only on moist soils, and cannot easily be conquered but by draining.

Corn-crowfoot *(ranunculus arvensis)* is a neat little plant, in most respects, except size, similar to the other species, and grows most abundantly in strong loamy or clayey soils. Deep and frequent stirrings with the hoe, are most likely to lessen its quantity.

Melilot *(trifoliu. melilotis officinalis)* is a common plant in the arable lands of the Vale. Did not the seeds communicate an unpleasant taste to the flour of wheat with which it happens to be mixed, it might possibly be cultivated with advantage, as all animals belonging to the farm are more or less fond of it.

Couch-grass *(triticum repens)* is a most troublesome and almost unconquerable weed on clay lands: on the light lands and loams, it may be dragged out and finished by hand-picking, with tolerable ease; but on the stiff soils, and particularly in the wet furrows, nothing but repeated ploughings and exposure to the sun during the heat of summer, can check the increase of it; hence, after a wet summer, the Vale lands are generally foul. A crop of spring vetches is well adapted to smother and keep it down.

Common thistle *(serratula arvensis)* is easily conquered by attention, on tillage lands. It may either be drawn with the thistle-drawer, or cut off deep with the hoe or spud-hook.

Corn-convolvulus, bind-weed, "with-wind," *(convolvulus arvensis,)* is most frequently found in clays and deep loams, into which the roots strike so far, that even trenching two spit and half deep will not reach to the extremity; and the smallest bit of the root left, will spring and rise to the surface. It entwines round, and entangles all plants in such a manner as either to bring them to the ground, or check vegetation, by its stricture on the surface.

Wild-oat *(avena fatua)* is the growth of particular districts, and cannot, it is said, be destroyed. In fields where the greatest care has been taken to hand-pull every stalk, it has appeared the following year in equal abundance. In new broken up leys, which have been in turf beyond the memory of man, they often spring up with as much luxuriance as if they were the natural produce of the soil. Hoeing, when the land is planted with beans or peas, will check them; but when they grow among wheat, it is not easy to distinguish the plants while young; and, in this case, they are left, till they are nearly in ear, and are then drawn by hand.

Blue-bonnet, knap-weed, corn-flower, *(centaurea cyanus,)* is a weed common in some fields, principally where the soil is loamy and mixed with pebbles. It should be extirpated by the hoe, and, when grown to blossom, by the hand.

Coltsfoot *(tussilago farfara)* is not found except on soils which are poor in their nature, and subject to moisture. Fertilization by manure, and draining, are the obvious remedies.

Chick-weed *(alsine media)* grows most plentifully on good and well cultivated lands. It mats so closely round the plants, and covers the surface so completely, as to keep out the influence of sun and air; and therefore requires to be removed, which is best done with the hoe.

Although there is scarcely any species of weed but what may be found on the various tillage lands of the county, these are the principal objects of the farmer's attention; and no doubt, under the improved system of agriculture, and more spirited and scientific management, they will annually decrease, till the fields shall be as they ought, as clean as a garden.

CHAPTER VIII.

SECT. I.—NATURAL MEADOWS AND PASTURES.

The richest natural meadows and pastures are found on the banks of the Severn, and other rivers which run through the Vale. They are liable to be overflowed once or twice every year, and receive their whole manure from the deposit of muddy particles, which subside during the inundation. The Avon is said to bring down the richest manure from the hills of Warwickshire; it is also certain that the Severn, in its progress, collects from the Tame, and other rivulets, a red soil, which leaves on the meadows a sediment of strong fertilizing powers. The effects are felt some miles below Gloucester; and the large meadow proprietors place their dependence of a strong crop of grass, on the land having been overflowed during the winter, or early in the spring. Farther down the Severn, the herbage assumes a different quality, in consequence of the salt water thrown over the lands by the tide. These meadows, or marshes, are generally grazed, being esteemed to afford the best possible pasture for horses and cattle, that require rest and spring physic. The beginning of May is the usual time for taking, or "tacking," in stock for pasture, and the prices are as follow. Horses, 4*s.* per week; two year old colts, 3*s.* 6*d.*; two year old beasts, 1*s*. 9*d*.; one year old, 1*s*. 6*d*.; sheep, 8*d*. in couples, or 6*d*. single.

The meadows on each side of the Severn, from about six miles below Gloucester to the full extent of it above, are mowed every year. It is now become almost a general practice, to sell the hay that is made from them to the barge-owners, for the supply of the Shropshire coal and other works, where a greater number of horses are employed than the neighbourhood can supply with hay; yet, though the crop is thus every year taken away without any return of dung to the land, the produce continues as abundant as ever it was in the memory of man, being little less than two tons on an acre. The meadows on the banks of the Leden are even more productive, owing to the soil brought down with the overflowing current from the rich lands of Herefordshire. If the inundation happens at a favourable season, before the spring is far advanced, and does not lie long on the meadows, it is not unusual to cut two tons and a half of hay on an acre. To counterbalance these advantages, however, a summer flood often comes on in the midst of harvest, and spoils the whole crop. This river being dammed up with mills, and not sufficiently increasing in width towards its efflux, can receive but a small addition of water, without swelling over the adjacent meadows; and therefore a few hours of close rain near the source, will produce an inundation below.

The natural grass lands of the other parts of the Vale, not within reach of floods, are generally fertile, though not equally so with those which have been mentioned. They have, however, advantages of their own, which, taken into the account, raise them nearly to a level. There is no danger of losing the crop from sudden inundations, and the quality is superior. The herbage of these must depend upon the nature of the soil, and the means used to assist it. A coarse grass, or species of sedge, "carnation grass," invariably shews itself on all poor clays, and pastures of all description of subsoil, while lying in a wet and unimproved state. On the contrary, creeping trefoil *(trifolium repens)*, meadow vetchling *(lathyrus pratensis)*, sweet-scented vernal grass *(anthoxanthum odoratum)*, meadow fescue *(festuca pratensis)*, decide the superiority of herbage, and generally of meadow management. In various parts of the Vale, particularly where a subsoil of blue clay rises near the surface, a great deal of poor, cold, and unproductive land is found, bearing little besides coltsfoot *(tussilago farfara)*, marsh flea-bane *(cineraria palustris)*, and various sedges and rushes; yet, however untractable and unpromising such land may be in appearance, there is no doubt but that, by the joint assistance of landlord and tenant, a valuable alteration for the better might soon be made.

Under the present management, as usually secured in the leases, pasture lands are mown and grazed alternately: in the immediate vicinity of Gloucester and other towns, a crop of hay is generally had every year; but in these places manure is plentiful, and the soil rich. On estates distant from towns, the lands will not bear such continued mowing, without repeated manuring, which in most situations is wanted for the tillage lands. This system, however, of mowing and grazing alternately, is by some able agriculturists exploded, as bad, on a grass farm; but if the same land be mowed every year, and the same fed or eaten off, the whole manure of the yard should be carried to the mowing ground. On dairy farms, this system is peculiarly advantageous, if not absolutely necessary to the making of good cheese. See chap. 13. sect. 1.

The manures mostly used are, stable-yard dung, soaper's ashes, the soil of ditches and pools, scrapings of roads, common coal ashes, and sweepings of the streets. See chap. 12. sect. 3.

Next to manuring, in point of utility, is weeding. This, however, is not much the practice of the county; there is perhaps no branch of agriculture more neglected. Farmers are sufficiently aware of the mischief occasioned by the growth of weeds among the corn, but seem not even to suspect a similar effect on the grass lands. The best grasses, however, are of too tender a nature to contend with weeds, which, being usually most forward in the spring, maintain their superiority, and occupy a large portion of surface, till the harvest.

Thistles of all kinds are very unpleasant weeds; either green or dried with the hay, they annoy the cattle in feeding, and therefore should never be permitted to grow long on any land; to prevent their growing at all, is perhaps impossible, but the increase of them may be checked by early attention: while, however, they are left to be mown with the grass, or to remain undisturbed in the highways during the summer, the seeds will be dispersed by the wind in various directions over the country: until a method, therefore, is adopted to correct the evil in its infancy, the labour bestowed by good farmers for the extirpation of this weed, will not produce a complete effect, although it will prevent the thistle from being carried to the mow in a state of equal maturity with the hay, and its seeds afterwards from being dispersed with the dung in the fields. Was every farmer to do the same, the encouragement to persevere in the practice would be powerful; but it is not probable, that a farmer will expend much in doing what the negligence of a neighbour will render ineffectual. Some thistles are annual, others perennial; where the distinction is not known, the safe method is to cut the root with a paddle deep in the ground, or draw up the root; and this should be done for the first time in spring, and again on the lattermath in autumn. See chap. 12. sect. 4.

Docks are extremely injurious to the herbage of pasture lands, but if taken in time may be easily conquered. If, however, they are permitted to ripen, they leave an immense quantity of seed for future crops; and, being perennials, the evil is increasing in such a multiplied proportion, as almost to exclude the growth of all other plants. In a large meadow adjoining Gloucester, these weeds have matured and shed their seeds so many years, that, at the time of mowing, the whole appears like a crop of docks. The " dock spit or spade" is the instrument with which they may be extirpated. This is a kind of crow or lever, with a claw at the end, a little curved, and divided into two prongs, similar to a hammer for drawing nails: an arm projects at about eight or ten inches from the lower end, for the foot to rest upon in forcing it into the ground, and a little above it, on the the back side, a curve of iron, projecting three inches; in the upper end, a handle is fastened as in a spade: the claw seizes the root of the plant, and, by a gentle pressure of the handle downwards, easily draws it out of the ground: with this instrument, many hundreds may be eradicated in a day.

Yellow rattle *(rhinanthus cristagalli)* generally grows in moist meadows, ripens its seeds, and sheds them before the time of mowing, when the dry husks make a rattling noise under the scythe: at this time, it contains no nutritious juice at all, though, when green, oxen and horses will sometimes eat it rather eagerly, and at other times refuse it. Having, however, no desirable quality to recommend its cultivation, and oftentimes overrunning large patches of ground, it ought to be destroyed; and being a biennial, this may easily be done, by grazing the land for three or four years following, and taking care that the stalks, which are left by the cattle, be skimmed off with a scythe before they are ripe enough to shed their seeds, or while they are in full blossom.*

The common or black knap or knob weed, provincially "hard-heads" *(centaurea nigra)*, is a vile and worthless weed, which cattle of no kind will touch, either green or dry; and yet is suffered on some pastures to grow and increase to such a degree, as to exclude the appearance of almost every other plant, and, though useless, are mowed with the other herbage, and preserved for winter fodder. This weed indicates poor land, though probably, by the use of soaper's ashes, it might be conquered; otherwise the land should be ploughed up, and converted to a better purpose.

Wood-waxen, dyers weed, or base broom *(genista tinctoria)*, grows abundantly in many parts of the Vale, generally on dry pastures: it is refused by no cattle, but sheep; yet, being inferior to good grasses, should be rooted up, except in places, where, as in the neighbourhood of Bristol, it is collected and carried, while in full blossom, to the manufacturers, who, by boiling, &c. extract a fine yellow colour from it.

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* A farmer near the northern borders of Gloucestershire, shewed me a sloping piece of grass land which had been overrun with rattle: without any view to the destruction of that, he conducted the water of an adjoining stream, as well as he could, over the piece, which however was not wholly watered; but it proved, that on the watered part, the rattle was destroyed, while it continued to grow on that portion which had escaped.

Tansey *(tanacetum vulgare)* is found in some pastures by the Severn side, and a few other places, but not abundant; it is an unpleasant weed, and should be eradicated with the spade.

The several species of crow-foot, provincially "crazeys," butter-flowers, butter-cups, and king-cups, which in the spring throw a yellow veil over the meadows, are to be reckoned among the useless weeds, having little to recommend them to notice but their gaudy appearance. In common observation, these plants are usually confounded, though the botanist easily distinguishes a great variety, four of which are principally found in pastures. First, pile-wort *(ranunculus ficaria)*. It has a yellow blossom, or corol, with five or more petals, heart-shaped angular leaves, smooth, like ivy, one flower on a stalk, and knotty roots. It blossoms early in the spring, rises little above the surface of the ground, chiefly in meadows that are rather moist, and is eaten only by sheep. Second, *ranunculus bulbosus*, or bulbous rooted; the striking characters of this plant, are a calyx bent back to the flower stalk, and the peduncle grooved or furrowed. Third, *ranunculus acris*, with a tall upright stalk, peduncle not furrowed as the last, but round and smooth, and the calyx spreading. Fourth, *ranunculus repens*, or creeping crazey, having, like the last, a spreading calyx, and peduncle furrowed. The three last are acrid and biting to the taste, and are therefore rejected by cattle nearly alike. It is indeed said, that the creeping crazey is more mild and palatable to some cattle; though it is to be suspected that cattle eat it, rather from necessity than liking, as, from its spreading along the surface, it becomes so matted with the herbage, that it must be taken up in some degree with it. The stalks of the two others are left standing, when the ground is quite bare around them: yet, when made with the hay, they are said to lose the pungent quality; and the brightness of the blossom in the rick, is always a sign of the whole having been well harvested.

The meadow pink, jagged flowered campion, or "ragged robin" *(lychnis flos cuculi)*, is a common weed in boggy meadows, beautiful in appearance, but of little use, and can be destroyed only by draining the land, and rendering it unfit for the growth of aquatic plants.

Cardamine, cuckow flower, or "ladies smock" *(cardamine pratensis)*, is very abundant in moist pastures, and said to be eaten rather eagerly by oxen.

Garlic *(allium ampeloprasum)* is found frequently in the meadows, and is noticed (chap. 13. sect. 1.) as a weed injurious to cow pastures.

Meadow-sweet *(spirea ulmaria)* grows abundantly in some low meads, and is considered as the mark of a poor soil. Young horned cattle and horses entirely reject it.

Common cowslips *(primula)* are almost an universal weed on the Vale lands, but in less proportion on those which are well manured, as is evident from their not being seen near the city. No cattle seem to eat them, since, in meadows where they constitute a great part of the herbage, when in blossom, they are left untouched.

Common rush *(juncus)* is an inhabitant of soils that are moist and strong; it abounds in the furrows of the pasture lands, and on the "meers" or strips of grass land left between the lands in the Vale, as the dividing mark of different properties. Draining destroys it.

Hemlock *(conium maculatum)* grows plentifully in the hedges. The other species are less common, though found in most pastures that are shaded by trees, particularly in orchards.

Orchis mascula, or male orchis, grows freely on stiff lands, but is entirely useless as a pasture plant. See conclusion.

Common yarrow *(achillea)* is plentifully intermixed with the herbage of the Vale, particularly where it has been much fed with horses. Some agriculturists have supposed that cattle are not averse to it; but I have observed that this weed has remained uneaten, till every blade of grass has been cropped close to the ground; and therefore, at the expence of manual labour, with the spade or three-pronged fork, it ought to be eradicated.

Ox-eye daisey *(chrysanthemum leucanthemum)* makes a conspicuous figure when in blossom, on the low meads on the banks of the Severn. As these meadows are mown every year, these weeds, however they might be refused when green, are mixed with the hay, and must be eaten with it, though probably they contain neither nutritious or palatable qualities. The best way to check their increase, would be to summer graze these meads, and prevent the seed from ripening; but hay, whatever be its goodness, is so valuable an article on the Severn banks, that this husbandry is scarcely to be expected.

Rest-harrow, "cammock", *(ononis arvensis spinosa)*, is a most troublesome weed, and a pretty sure proof of want of good cultivation and manure. By the former, the tillage lands may easily be cleared of it, and by well rotted horse-dung even pasture lands may be assisted; but rather than such a disagreeable plant should continue to grow, where its place might be supplied with good herbage, neither labour or expence should be spared. The little advantage it gives to sheep, which will eat the young shoots before the prickles are formed, is not a sufficient inducement in the calculation of a good farmer, to leave it undisturbed. In the parish of Elmore is a pasture ground almost covered with it; which lies too far from the farm-house to have manure easily conveyed to it. The occupier tried the experiment of drawing it out by the roots, but discontinued it from an idea that it came up with greater strength and abundance the next year. The truth is, that the business is but half done, if the roots are not entirely removed; as every broken piece will throw out shoots; and from long continuance of the plant on the spot, and the annual shedding of its seeds, it is probable that a new crop will arise in the following spring: but the farmer should not be discouraged, on the failure of his first attempt; since, by continually watching the weeds in their early growth, and cutting them off with the hoe, they would gradually be destroyed; and the process would be much assisted by well dressing the places with rotten horse-dung, as before mentioned.

SECT. II.—ARTIFICIAL GRASSES.

On the Cotswolds, and other hilly parts of the county, where few passages occur of natural grass land, it is the practice to sow the seeds of saintfoin, common red clover, white Dutch clover, ray-grass, trefoil and dill. Artificial grasses, indeed, are necessary to the very existence of a Cotswold farm, and highly useful on all others. An arable farm cannot have too much hay; for it is the stock in the winter, which makes the farmer's profit, not so much by the return of money from the expenditure of the hay, as by the great quantity of manure produced from the excrements of the sheep and cattle which eat it.

Saintfoin *(hedysarum onobrychis)* is cultivated with great success. The nature of this grass is to strike with a long tap root into the interstices of the subjacent rock; and to this purpose the calcareous rubbly rocks of this district, whose continuity is every where broken, and masses disjointed to a great depth, is well adapted; for into these openings the roots penetrate with uncommon vigour, and draw a stock of fertilizing principles in the greatest drought.

That the flourishing state of saintfoin plants is not owing to any peculiar powers of vegetation in the soil, is unquestionable; for great luxuriance is often to be observed in situations, which present to the eye little more than naked rock, or at most but thinly covered with not more than an inch of mould. In 1803, a field in the parish of Iron Acton was cropped with saintfoin; the soil good, but thin, and some places barely covering the rock. During the summer, and till harvest, the crop appeared luxuriant and flourishing; but the next year it was gone; the field ploughed up, and sown with other seeds. The failure was not owing to any thing uncongenial in the soil; but to the nature of the subrock, which is a hard and almost impenetrable stone, without rubble, strongly charged with iron, and lying in immense strata, which, separating in an horizontal direction, leave no fissures or interstices, into which the root of the plant can insinuate.

The seed of saintfoin is sown with oats after wheat, at the rate of two or three bushels upon an acre, according to the nature of the land and goodness of seed. Old seed will not grow; and as it is perhaps difficult always to be sure of having it unmixed, the safest way is to sow more than would otherwise be necessary, for in the case of the land being in high condition, and the seed new and good, six pecks would be sufficient.*

This practice of sowing after wheat with oats, is best on weak and gravelly soils, which are not inclinable to turf; but if the land be of a deeper staple, and more inclining to turf, it is reckoned by some, more advantageous to lay it down clean on the barley crop after turnips. The reason is, that it is a desirable circumstance, on the worn out saintfoins, to have a sufficient turf to breast-plough and burn, for the sake of the ashes, which alone can ensure a crop of turnips.

It is mowed the summer following for hay; though some think, that the better management would be to seed it the first year, or leave it uncut at least, till the seeds have begun to drop; under the idea, that this addition of new seed would more completely cover the ground. The general practice, however, is, to mow the first year, and continue to do so annually, till the crop is wearing out, which, if suffered to continue so long, will be in six or seven years.† A summer's depasturing is never allowed, and care is at all times required in permitting any heavy stock to run upon it. Whatever may be the way in which the mischief is done, whether by eating off the crown or bud, by biting too close, and so drawing up the young plants; or by treading it into the ground, and so letting in the frost, to the destruction of the roots; it is certain, that if, while it is growing, it be loaded heavily with large cattle, or even with sheep, much injury is done: therefore, the aftermath is used for the pasturing of lambs, which are turned in about the middle of September, at the rate of two to an acre, and kept on for six weeks.

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* Hop clover-seed is often mixed with the saintfoin, with the view of securing a good mowth the first year.

† Saintfoin is supposed to have degenerated, as formerly it would last fourteen or fifteen years. It has been planted on the Cotswolds about seventy years.

Harvesting. This grass requires great attention as to the proper time of mowing. If it be cut too early, the plant is injured by bleeding; a circumstance likely to happen in so succulent a stalk. The consequence of bleeding is, the exhausting of the juices from the main root, and rendering it less vigorous for the next summer. If it be mowed too late, the hay is impoverished, having no sap either for nourishment or fermentation. Horses indeed will eat the stalks, even when it has stood for seed, if cut into chaff; but it is probably not more nutritious than peas-straw. The best time of cutting, therefore, is, when it is about half blossom: in this state the stalks are full of sap, but the current is more sluggish, and of consequence the wound occasioned by the scythe will heal sooner, and the root be less exhausted. It is made into hay as other grass, excepting that the more succulent the plant is, the more time is required.

Produce. A ton and half upon an acre, is esteemed a good crop, though sometimes it is greater. The hay is applied to the usual purposes of winter-food for horses, oxen, folded sheep, with vetches or turnips, &c. but loses its nutritious quality, if kept beyond the following summer. The last year or two, it is grazed entirely with sheep, previous to its being put into a state of preparation for turnips: or in one of those years a crop of seed is taken, which usually turns out twelve or fourteen bushels, worth from 5s. to 7s. a bushel. The seed is inclosed in a rough husk, which is cracked to ascertain its goodness:

if the kernel be of a dark brown colour, it is good; if shrivelled and yellowish, bad.

It is said, that saintfoin cannot be raised on the same land again to any great advantage, in less than forty or fifty years: the attempt has been made, but without success. This seems to prove what has been before stated, that the principal nourishment is drawn from the interstices of the subrock, and that little depends on the surface soil, except first setting the seeds in motion. Whether the food that nourishes the root be a kind of native lime, usually found in the breaking up of the Cotswold rocks, or what else, is difficult to ascertain; it seems, however, that the cultivator has no artificial mode of recruiting it, and is therefore obliged to leave the business to the slow operations of nature.

Saintfoin, in all stages of its growth, is much annoyed by the *bromus mollis*, provincially bents, lob or loggerheads. This is an early coarse grass, and, getting the start of the other, covers the land with its wide spreading blades to a considerable extent. It is said to grow in the greatest abundance on well conditioned, clean lands; and therefore, with some, the practice is, to sow the saintfoin on foul couchy land, where the bents are soon smothered, or checked at least; while the saintfoin, drawing its nourishment from below the soil, goes on with vigour, and eventually, by its luxuriance, covers or destroys the couch. After all, it is a question with many good farmers, whether the practice be good, or not, and whether it is not more advantageous to sow on clean land, and by repeated hand-weedings extirpate the bents as they spring up. If by this management they are not all destroyed, they may at least be kept under, and prevented from seeding.

About thirty years ago, the saintfoin was attacked by a red spotted fly, something like a butterfly, but with wings longer and narrower: it ate the leaves to the stalks, and the grubs which were produced from their eggs deposited at the roots, devoured what the fly had spared. They were vulgarly called, saintfoin eaters; but soon after disappeared.

Ray-grass *(lolium perenne.)* The farmers of this district are excelled by none, in the management of this useful grass. The sort lately much esteemed, is that which takes its name from the person who paid peculiar attention to the collection of it, at least in a larger quantity, than any other—Peacey's ray-grass. It was first selected from the finest meadows in the vallies of the Cotswolds, and, by repeated sowings, a sufficient quantity of seeds was raised for himself and neighbours. Opinions differ as to its superiority over the common ray-grass, though its extensive use would seem to justify the claim. Its peculiar properties are, early growth, large crops, grateful flavour, nutritious food, and permanence. It springs early, so as to afford a good bite for cattle, before the blades of other grasses begin to move; the produce is very considerable, and the vegetation so rapid, that a large stock is necessary to keep it low; the flavour is highly palatable to cattle, as is evident from the preference they give it to other grasses; and, while kept close down, it is very nutritious; but if suffered to grow too much to stalk, the effects, both in point of nourishment and flavour, are lost: it is also a perennial, and improves yearly; for after having been laid two or three years, it is less inclinable to bent, forms a thicker and finer pile of grass, by matting and swarding over the land. This circumstance, perhaps, lowers its advantages in some degree, for temporary leys, as it is supposed, from its continuance in the ground, to injure the succeeding wheat crop; the evil, however, is said to be easily obviated, by early spring stocking, and keeping on a sufficient number of horses and cattle, to bite all the bents close down. For laying down to permanent pasture, however, its excellence cannot be questioned. Hay of the first quality for feeding, is made from it, if cut in an early state, and before the juices are exhausted. Thus managed, the virtue of the grass is preserved, and the hay brings on fatting cattle with great rapidity.

Trefoil, or "hop clover" *(trifolium procumbens)*, is frequently sown among ray-grass, and is found to improve the quality of the hay in consumption; when designed for pasturage, white or Dutch clover *(trifolium repens)*, and red clover *(trifolium pratense)*, are mixed with it.

If clover and ray-grass be intended as a preparation for wheat, they are mowed the first year, grazed the second till midsummer, and then ploughed immediately, to lie till the wheat sowing in August.

If it is intended to lay down to permanent pasture, the Cotswold farmer often turnips the land for two successive years, and uses the Dutch clover in greater proportion than any other. The usual proportion of seeds is, broad clover, six pounds; Peacey's ray-grass, one bushel; trefoil, two pounds; Dutch clover, two pounds. This is the allowance for a statute acre. The ray is sometimes left out, and the deficiency made up with other seeds, much depending on the choice of the farmer; but the general substitute is Dutch clover, especially if the land be intended to lie down many years; but if a large crop of grass for hay be the object, trefoil is then the substitute, as being capable of producing the heaviest burden.

In the Vale, where it is intended to lay down, the land is well cleaned and manured for barley, and the seeds sown after it. Common ray-grass, Dutch clover, hop clover, and narrow-rib plantain *(plantago lanceolata)*, are mostly used. A field of seven acres in Quedgeley, was prepared with barley, and sown with these seeds nearly in the following proportions: ray-grass, sixteen bushels; Dutch clover, twelve pounds; hop clover, five pounds; about two bushels of plantain. It was fed down the following year (1804), and mowed in 1805. The crop was good; but it would perhaps have been better to have grazed it again, or well manured it before mowing. The ray and plantain seem to have been in too large proportion; the latter particularly, as in the Vale lands it will always be found in sufficient abundance, without sowing; besides, the narrow plantain, though much relished by sheep, is so succulent, and difficult to be dried into hay, that in meadows chiefly designed for mowing, it is not a desirable addition to the herbage. If dried too little, it endangers the rick; if too much, it turns black, and loses all nutritious quality.

Lucerne (*medicago sativa*) is not cultivated on any large scale, being attended with too much trouble for the farmer, and requiring a good, deep, dry and rich loam, which probably bears crops of other kinds, equally advantageous, and less expensive in the management.

Dill* (*anethum segetum*) has been sown on the Cotswolds fifty or sixty years, and is now become frequent.

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[*] Not having seen any account of this plant in the modern agricultural books which have fallen under my notice, I merely conjecture that it is the *anethum segetum* of Linnæus, and a native of Portugal. In the new edition of Linnæus, by Turton, is the following description: Anethum segetum. Portugal, Jacq. hort. 2.

It makes an excellent hay for all kinds of cattle, but best for ewes with sucking lambs, producing milk highly nutritious and abundant. It possesses also, the property of growing freely on poor, thin, and impoverished lands, where other seeds would make a scanty return. The seeds are, in colour, inclining to red; in form, resembling a vetch, but smaller; they are generally sown broad-cast in March or April, at the rate of a bushel and half on an acre; soon cover the ground, and require no hoeing or other attention, till ready for cutting, which, in the most favourable seasons, is seldom the case before the middle or latter end of September, if left for seed. Some cultivators, indeed, cut it for hay, before the blossom withers, and then it produces about a ton on an acre: this, however, is considered as the least beneficial mode, because the straw, after the seed has been threshed out, is but little, or not at all, inferior to the early mowed. The kid or pod resembles that of a pea, and must be fully ripe before it is harvested; but, if it be too ripe, easily sheds. The produce of seed is often twenty-four Winchester bushels on an acre, and the price varies from 5s. to 8s. per bushel. Ground with barley, it is excellent food for fattening cattle and hogs.

SECT. III.—HAY HARVEST.

On the Cotswolds, where artificial grasses are principally raised, hay harvest usually commences the latter end of May or beginning of June.

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tab. 132. *Leaves* twice or thrice pinnate, with filiform leafets. Mortimer mentions, "dill as raised of seed, which is ripe in August."

I am not informed whether dill is grown in other counties; it is certainly deserving of trial, on weak and hungry soils, any where.

In the Vale, where the natural grasses chiefly prevail, the pasture is hained up, if intended for early mowing, about Candlemas; if otherwise, about Lady-day: the cow and other animal excrements are well beaten with the prongs of the pitchfork, and dispersed, as also the hillocks of mould which have been raised by the moles since last mowing: stones, and other rubble, are picked up by women and children, and carried away. If manure of any kind has been laid on, it is brushed with thorns, fastened to the upper side of the harrow; and, where the land is not too wet, it is afterwards rolled.

Grass grounds, which have been early hained, are in favourable seasons ready for the scythe by the second week in June; and the hay which is made at this time is reckoned the best, and usually reserved for feeding. Immediately in the neighbourhood of towns, and particularly of Gloucester, this is a busy season; but in the country, where the land is cold and late hained, the hay harvest seldom commences before the beginning of July.

The process of hay harvesting is nearly the same as in other counties. The grass lies in swathe during the first day of cutting, unless the weather be remarkably fine, when it is immediately broken, "tedded," and in the evening put into grass-cock, and again broken in the morning: at night it is collected into larger cocks, and the day following broken into rows, ("wallies"); afterwards raked into "wind-rows" closer together; in the evening it is put into "hay-cocks" of larger size; and in this state continues for some days, or is carried directly to the rick; or brought together "into wind-cocks," containing each from a half to a whole ton. In this last state, it remains secured from the weather, and goes through the first fermentation. Where it is wished to "rid" the ground with haste, the hay is carried directly from the hay-cock, or even from the wind-rows, to the rick-yard, and there put in stacks of three or four tons each, and left to heat: in the midst of the heat, it is again moved into larger stacks or mows, and, from the check it has thus received, seldom heats afterwards to such a degree as to produce danger of ignition. To guard, however, against this danger, it is the usual practice to place a bag stuffed with hay, or a large basket or frame of hoops, (" a lanthorn,") in the centre of the stack, which, being gradually drawn up, leaves a vacant space from bottom to top. To this chimney, or funnel, the vapours during the process of fermentation are drawn, and, by keeping up a communication with the external air, are prevented from giving a black tinge to the hay, as well as from ignition, which would probably be the case in mows of from sixty to a hundred ton, if no such preventive check were used. In the parts immediately adjoining or surrounding the aperture, the colour of the hay is somewhat altered, from the concentration of the vapours, which, during the fermentation, issue out at the top in a considerable quantity, and oftentimes in the night exhibit a kind of flashing phosphoric light. Large mows being made in an oblong square, will allow several apertures, one at least to every twenty tons of hay.

The process of hay-making will of course be varied, according to the nature of the weather. If it be rainy and unfavourable, the grass is left unbroken in the swathes, and occasionally turned over. It will continue several days in this way without receiving damage; but if it be caught in a half made state by rain, the wet is seldom entirely got out, and, in the stack, turns to a white, disagreeable, stinking mould. The natural juices having been expelled by the water, a kind fermentation does not come on; and, of consequence, if the hay be not spoiled by mould, it is little better than straw, when thus deprived of its feeding qualities.

It is obvious that grass requires more or less drying, according to the nature of the herbage, and the state of its growth. Where it is mixed a good deal with succulent plants, such as clover, narrow-leaved plantain *(plantago lanceolata)*, dandelion, &c. or mowed while the juices run freely, it requires careful drying, and frequent moving. In either of these cases, it is usual to leave it some time in wind-cocks, or small stacks, as before stated, to prevent ignition; but if the grass be benty, in consequence of being left to be too ripe, which is much the case in the Vale, it requires little more than a day's withering, to make it fit for stacking; if it be left much longer, the juices will be scarcely sufficient to bring on any fermentation; and, without this, the hay has neither flavour or nourishment.

When the weather is either catching, or the herbage unusually full of sap, and there is reason to expect that it will "come again" in the mow, layings of old hay, or peas-straw, are placed at intervals of two or three feet, which check the heat, by diminishing the thickness of the body. This answers the purpose extremely well, and the straw becomes more palatable as fodder, by contracting a degree of hay flavour from the steam passing through it.

To secure the hay from being wetted, while it is being lodged in the mows, a large sail-cloth is thrown over a cross-bar, and hangs down on each side, like the roof of a building. The cross-bar is connected with the tops of two upright poles by ropes and pullies, by which it is raised or let down at pleasure. The uprights are let firm into the ground, or, which is better, as being more easily shifted, into the naves of two cart-wheels lying on the ground, on two opposite sides of the mow. This is an imitation of the Dutch barn, and being neither so expensive or cumbersome, answers all the useful purposes of that contrivance.

The implements used are, the scythe, pitch-fork with two prongs, and rake. The blade of the scythe is about three feet and a half long, and the swathe seldom exceeds five or six feet. The Gloucestershire mower is supposed to lose time, and to do less work in a given period, than is done in other counties, or might be done without much additional trouble; but the apparent ease with which the work is performed, together with the neat and level state in which the ground is left, rather give this mode a preference to the more hasty, but more slovenly and wasteful manner, in which the same operation is performed in some other parts of the island. In this county, the place where the scythe enters is scarcely discernible, and the whole has the appearance of a lawn; while in others just noticed, six or seven inches width of uncut grass is left, and the surface appears uneven and defaced with ridges.

The common wooden rake is used in the Vale, and, in the hands of the women accustomed to it, goes over a great deal of ground in a little time.

The ell-rake is found only on the Cotswolds, and there not generally. See chap. 5. sect. 1.

The pitch-fork, not differing from those used in other counties, requires no particular account.

When the mows have done heating, and are well settled, they are secured from the consequences of exposure by thatching. In proportion to the plenty of straw, and the good husbandry of the farmer, the covering is more or less extended. In some instances, only three or four feet from the top are thatched; in others, the covering reaches down to the eaves, and forms a complete security against all contingencies of weather.

It is a commendation generally due to the farmers of the county, to observe, that it would be difficult to surpass the neatness and care with which their hay-stacks are secured, and particularly so in the lower part of the Vale, where, the heads of the sheaves being cut off before threshing, the straw is unbroken by the flail, and forms a covering uncommonly neat and durable. See chap. 3. sect. 2.

The lattermath, or after-grass, being seldom mowed, is generally eaten off by cattle before winter comes on. When sold, it is reckoned to be worth nearly half the annual rent of the land. It is the general opinion, both of landlord and tenants, that twice mowing is injurious, and is therefore never allowed by the former, except in case of the land being high in cultivation, and on condition of its receiving an extraordinary dressing of manure.

SECT. IV.—FEEDING.

Grass. The pastures are in general forward enough by the beginning of May for turning cattle into them; and in these, with occasional changes, they are continued, till the after-grass of the mown meadows is sufficiently grown, which will be about the middle of August; after this is eaten down, the fatting cattle are removed to the stalls, or farm-yards, where they are finished with hay and other substitutes.

The management of the stall is no where better attended to. The stalls are built in a long range, proportioned to the size of the farm, of sufficient width to admit free exercise to the beast every way: in a complete state, they are inclosed on every side, so as to preserve a regular temperature of warmth during the winter. Good water near at hand, and cleanliness, are indispensible requisites.

Feeding-cattle are by some graziers allowed to have the range of the fold, or yard, where are open sheds for them to go to, either for shelter or food. If on hay, they eat out of racks; or if flour, &c. out of troughs or mangers. This is the old practice continued from necessity, for want of proper buildings, rather than from disapprobation of the modern method, which is unquestionably the best, but applicable only to large farms.

Hay, corn steeped in water, or ground, and linseed-oil-cake, are the food most in use.

Hay forms a principal part, and that which was cut early, and moderately heated, is preferred.

Barley and bean-flour mixed, is almost universally given as an assistant to hay.

Barley steeped in boiling water, with potatoes steamed, has been used with success; after some time, the saccharine parts of the corn, in a state of dissolution, form a stiff jelly, which is cut and distributed to the cattle. The meat produced by either of these modes, is of excellent quality, and the fat usually proves delicately white.

Linseed-oil-cakes, owing to their greatly advanced price, are not much used in places distant from the mills where the oil is expressed. On the spot, they are sold at ten guineas per ton, which is an advance of more than seven, in a few years; yet, even at this high price, are considered a profitable food for oxen, where the expence of land carriage can be reduced by water conveyance.

It is common among the Vale farmers to buy in, about the middle of the summer, or as late as August, small Welch heifers, "burries," to turn into the lattermaths. They generally yield a good profit, according to their size, and goodness of keep, having been known to double their original cost in the market, early in the spring, with the assistance of a little hay.

The different modes of feeding, as well as the kinds of food, are practised according to the ideas of profit entertained by different graziers. Stall-feeding is usually esteemed the most profitable: the least advantageous mode, is that of spending the hay on the open ground, besides the mischief done by treading in wet weather; this, however, is not commonly practised, especially with heavy cattle.

The two great points in fattening cattle, are, to make the greatest improvement of flesh and fat in a given time, with a given quantity of food, and to produce the most manure. Stall-feeding seems to promise both, in the most effectual manner. Animals of all kinds feed most quickly, when kept quiet, uninterrupted, and regularly served with food. Much likewise depends on a proper degree of warmth and cleanliness, which can only be effected by the economy of the feeding-stall. Manure is also raised in a greater quantity by this, than any other way. When cattle have the range of the fold, they drop their dung and urine irregularly, and often lay themselves down upon it. In open pasture-feeding, besides the injury done immediately to the herbage of the spot where the dung drops and remains, no advantage is taken of the mixture of it with straw, to produce that fermentation which is necessary to bring the whole into a state of putrefaction, and consequent preparation for the land; besides that the dung left dispersed about the pasture, is continually wasting from rains, and other causes, and the urine, perhaps the most valuable part, lost on the ground.

The cattle usually fed in the stalls, are of the Herefordshire breed: they are first worked by the breeders, and, at six or seven years old, bought by the graziers at Gloucester, Hereford, Ross, &c. Though this sort, however, is generally the favourite, yet the Glamorganshire, Pembrokeshire, and Devonshire, have their admirers. If weight of carcase only be considered, the Herefordshire have decidedly the advantage, as, at the age before mentioned, they may easily be brought to sixteen score per quarter; whereas a good Devonshire will seldom exceed twelve, and the others not so much. In their aptitude to cover, and that upon the best points, they are at least equal to any breed, at the same time that they carry little offal or lumber.

These oxen are bought in at spring and autumn; for the first purpose, low in flesh, to run on the summer pastures; for the latter, more forward, for the stall. A year, or thereabouts, is the average time for finishing an ox: much, of course, depends on the state in which he comes to the pasture or stall, and the degree of proof he makes. The consumption of a large beast during that time, is about two tons of hay, with barley and bean-flour; these articles are given at stated periods of the day, usually three meals of the former, and two of the latter. If linseed-cake be used, about half a peck, broken into small pieces, is given at twice, a trough of water continually within reach.

When fat, they are generally sent to Smithfield market; or, from the lower part of the county, to Bristol and Bath. Regular drovers take them from the neighbourhood of Gloucester to London, at the expence of about 22*s*. a head, including the charges of salesmen, to whom they are consigned, and other demands.

On a capital grazing farm in the vicinity of Gloucester, about sixty bullocks, chiefly Herefordshire, are generally on feed. In the summer they are kept on good meadow grass; and in autumn are taken to stall, and for some time fed with hay; afterwards with oil-cake, which, being first broken, is put into the troughs, after the cattle have nearly filled themselves with hay. They have hay three times, and cake twice a day. At first, the cake does not appear palatable, but in a little time is eaten greedily.

To prepare food for cattle, either for the purpose of fattening or keeping them in heart for work, the chaff-cutter and bruising-mill are highly useful. George Talbot, Esq. of Temple Guiting, cuts, with the former, all the hay and straw intended for provender into chaff, and gives it separately, or mixed in various proportions, according to the condition required for the several animals, and the work they are expected to perform. The cows, oxen, &c. are all tied up in the winter, and let loose, only when the weather is fine. The sheep have their chaff given them in cribs constructed for that purpose. The oats, barley, peas, &c. used for horses or cattle, except what is ground down for pigs or fatting cattle, are all bruised by iron cylinders. This process is simple, and expeditious, and considerably increases the nutriment from a given quantity of corn.

Calves are fatted on stages erected for that purpose. The building, and stage, will be proportioned to the number of calves intended to be fatted. Eighteen inches in width, and four feet in length, are allowed to each calf. The stage is elevated about eighteen inches from the ground, and floored with wooden "spars," or strips, two or three inches square, and an inch apart, running parallel with the front. A range of round spars, three or four feet high, are let into the front sill of the stage, through a rail at top, loose enough to be occasionally removed, for the introduction of the calf. These upright spars are placed nine inches apart, and have alternately a double ring of iron, turning by a swivel, attached to them, large enough to move with freedom up and down. The calf is fastened to the ring, by a broad collar of leather about his neck; this allows him room to put his head between the uprights, just far enough to drink out of a pail, which is placed occasionally at the front of the stage, and also to lick barley flour and chalk, from the trough before him. The trough is a foot wide, and three feet are left for a passage or gang-way. The timbers are fastened to the walls in the usual way, or mortised at pleasure.

While calves are on the stage, it is a principal object of attention to prevent scouring; and as this disorder is supposed to arise from a superabundant acidity in the stomach, flour and chalk are kept constantly within their reach, as correctives, and are found to answer the purpose. The running calf seldom scours; the cause of the disorder is therefore in the milk which is given them; this being the produce of different cows, cannot equal the effects of that of the dam, since nature unquestionably varies her milk, to suit the progressive state of the calf.

A calf is usually fit for the butcher in five or six weeks, during which time he has consumed at least 7s. worth of milk per week, and may be worth, at the end of it, from four to six guineas, according to the season.

On the best managed farms, it is contrived, that the cows be kept at a distance, far enough to be out of the hearing of the calves; as otherwise, both are kept in a state of irritation, which retards the progress of one, and injures the milk of the other.

Hogs are fattened in the styes of every farm-yard, with beans, peas, or barley, ground into flour. Barley is reckoned not to make so much proof as either of the other, or such firm flesh as that fed with beans and peas.

Potatoes, either steamed or boiled, are good food for pigs; but the progress is greater, and the fat firmer, when mixed with ground corn of any kind.

Potatoes ground in a cyder-mill, and mixed with flour, are found to answer the purpose well, and saves the expence of fire-fuel, which in many situations is of material importance. With this mixture, the hogs are allowed no water but what the potatoes supply.

This root contains twenty-two parts of water to three and a half of flour; or, acording to the analysis of Gerard, the proportions are, of 100 parts, 76 of water, 19 of a fine powder, and 5 of a fibrous and leafy substance.

Fat pigs, from ten to twenty score pounds weight, are most esteemed by the buyers; but, for the use of the farm, they are made up to thirty score or more.

After being killed, it is the custom of the county to burn, or "swale" them, and dry the meat in chimnies, which then becomes the principal food of labourers during the harvest.

Sheep are fed in every part of the county, but in different ways. On the Cotswolds, turnips form a principal part of their food, and the wethers are sent off first from turnips, and afterwards from seeds, to London. While they are on turnips, it is necessary to supply them well with hay, in the proportion at least of one ton to an acre. (See chap. 7. sect. 4.)

A genuine Cotswold wether, at four years old, will weigh from thirty to forty pounds per quarter, if allowed a proper time, without forced feeding: when crossed with the new Leicester, the average weight is from twenty-two to thirty pounds per quarter.

In the upper Vale, the same kinds of sheep are fatted on grass for the London, or neighbouring markets. In the Vale of Berkeley, and below, great numbers of sheep are fed on the lattermaths, for the Bath, Bristol, and other markets. The sorts principally purchased for the purpose, are Somerset wethers, Mendip ewes, and, of the Wilts, both wethers and ewes with lambs. These are bought in about October, at the Somerton, Pensford, Devizes, and other fairs. The lambs go off to the butcher in spring; the ewes are then put to good pasture, frequently changed, and become fat between Michaelmas and Christmas. The Mendip ewes drop their lambs before, or about Christmas; and, if a ram be suffered to run with them, may have a second breed ready for the butcher in August, and are then turned off for fatting.

Neither of the before-mentioned sorts are supposed to have an equal propensity to feeding with the hornless ("not") breed, or those crossed with the new Leicester. The rich pasture, however, of the Vale brings them on apace; and if, as winter approaches, they are kept up with sweet well made hay, the profit is considerable. They eat their hay out of double racks, placed on a stage, with low wheels, for the purpose of being removed with ease, and distributing their dung on all parts of the pasture. The two first will weigh from twenty to twenty-six pounds per quarter; but the Mendip not more than twelve or fourteen.

On the low lands, four or five miles on each side of Gloucester, the Ryeland sheep are principally fed; they have the range of extensive commons, where they soon fatten, and go off; which is an object of great importance, as it would be unsafe, on lands liable to rot, to keep a large breed of sheep, which require much time to finish for the market.

In the Forest district, the same sheep, with a few of the Forest breed, are fatted on grass in summer, and turnips, with hay, or barley-meal, in winter: when fat, the Ryelander will weigh from ten to sixteen pounds per quarter: in the latter instance, it is suspected, that some cross has enlarged the breed. This indeed has lately been so much the case, that a genuine Ryeland sheep is scarcely to be found.

CHAPTER IX.

GARDENS AND ORCHARDS.

Horticulture, and the advantages resulting from it, are so much better understood than they were some years since, that gardens are now managed among the farmers, with neatness, attention, and skill. If, sometimes, the more important business of the farm may require long and unusual exertions, the garden is necessarily and properly neglected, as a concern of inferior consideration; yet, generally speaking, the charge of neglect or slovenliness, is inapplicable to the garden culture of this county.

The gardens of the village labourers exhibit various instances of industry; and the character of the inhabitant may usually be determined by the appearance of cultivation without. Most of the cottages in the county possess, in a greater or less degree, this useful appendage; few, however, in a quantity sufficiently large to effect any great advantage. To what size, indeed, cottage gardens may be extended, with safety to the interests of agriculture, can only be ascertained by long continued experiments on a large scale. It has been already observed (chap. 3. sect. 3), that they ought not to be so far extended as to occupy too great a portion of the labourer's time; his attentions being wanted elsewhere. Wheat should not be among the productions of small inclosures; because it is a lure to the depredations of small birds; and the trouble of the different processes, before it is ready for the mill, probably overbalances the profit, besides the difficulty of finding manure sufficient to keep the land in a good state of cultivation. Plantations of beans, peas, cabbages, and potatoes, will assist the cottager, in the keep of a pig, more than any other vegetable. In summer, the refuse of the cabbage, with wash, &c. will be sufficient for food; the straw of the beans and peas, with the haulm of the potatoes, will supply litter; while the less valuable of the potatoes, boiled or steamed, the gleanings of the harvest, and a little additional corn, will fatten him. If field peas or beans be cultivated, a part may be gathered green for eating, and the remainder left to ripen for the use of the stye. By this management, manure will be made for the land, as almost the whole of the produce will be again returned to it in the state of dung.

Fruit-trees may also be planted in the quarters, and gooseberries and currants on the edges of the borders. Planting fruit-trees in the hedges, or even near them, is objectionable, because it furnishes a temptation to theft and plunder, and is also the certain cause of injury to the fence. The latter is a consideration of great importance, as a good fence, to the cottager, is more especially needful, since he is obliged to be absent from home a great part of the day, and sometimes takes his family with him into the fields. During this absence, his garden, unless well fenced, is subject to the inroads, of sheep, pigs, and geese, which are loose upon the common.

Culinary productions being so advantageous to the cottager,* the exertions of those, who, anxious for the increased comforts of the poor, have proposed rewards as an encouragement, for the best managed gardens, are highly wise and humane. The premium, however, should be given to him, who, without diminishing the attentions due to the farmer, with the least loss of time and regular earnings, as well as the least encroachment on Sabbath duties, has cultivated his garden with superior neatness and success. Loss of time is a material consideration, because every day, which does not bring in its proper return of money, is really lost to the family, and must occasion a reduction of some articles necessary to their comfortable subsistence. The industrious cottager, who has an eye to all these circumstances, will employ in his garden the extra hours, before he begins, and after he leaves off, the regular work of the day: this becomes a real saving; being so much time gained from idleness, and so much added to the stock of comforts, which others, under the influence of a lounging and indolent disposition, throw away. Where a cottager happens to have a proper spirit of independence, or a just regard for his family, with a desire of improving his situation by honest industry, he will not measure his labours by the exact line of custom, but will make some extraordinary efforts: as this, however, is not the task of necessity, he will do no more than his strength will fairly allow him, though, as the labour will probably go on with the assistance of his family, it will prove a pleasing recreation, rather than an unwilling drudgery.

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* Cottagers are of four kinds: First, the proprietor of a small house by purchase or inheritance; secondly, the proprietor of a cottage built at his own expence, with the partial assistance of his neighbours, on the waste; thirdly, the renter of a cottage in a manufacturing district; and, fourthly, the renter of one in a country village. The second and last, are the only persons to whom these observations are intended to apply. The first is supposed to be so far independent, as not to be an object of parochial attention or relief; and the last generally resides in those parts of the country, where houses are too much crowded to admit of any considerable allotment for garden; or, if it did, the manufacturing labourer is in the receipt of wages too high to allow any attention to other concerns, and his children are, or ought to be, more advantageously employed, in the manufactory, than they could be in the garden.

The utility of a garden to a cottager, being allowed, the next enquiry is, what quantity of land will answer all useful purposes, without encroaching on the time and labour which are due to another quarter. The interval between Lady-day and Michaelmas, is the portion of the year in which the labourer will derive spare time from the regular engagements of the day; and nine hours for each week, are the full average leisure that can be admitted on calculation. Of one hundred and eighty-six days, twenty-six will be deducted for the Sundays; and, during two months at least, every hour of the day will be wanted for the harvests; so that the whole which the labourer will be able to employ on his own land, will amount to about two hundred and seventy-three hours, or twenty-two days and three quarters. Supposing the garden to comprehend half an acre, or eighty perch, and that a good workman can dig ten perch per day, it will then require eight full days for digging, and another for planting. When the seeds are properly got in, the remaining time will not be more than enough for weeding, hoeing, digging, and harvesting, exclusive of the assistance which may be expected from the family. From the wife, indeed, no great help can be had, as she will find her time fully engaged in domestic employments; and, from the children, not much more, since, if they are old enough to undertake any thing of labour, they will be useful to the farmer in various ways, and bring home some pecuniary aid to the general stock: the main dependance, therefore, is on the labourer himself; and he would probably be equal to the management of a garden of this size with ease, if he could employ the quantity of time allowed, on the premised calculation, to the best advantage; but as it consists of fractional parts, and his greatest leisure will be when the spade is least wanted, there will be some difficulty in adapting it to the necessities of his garden. Two-thirds of the seeds and plants will require an early attention; potatoes will bear later planting, and of course will suit him better. These difficulties are not insurmountable; and it is probable that half an acre of land may be cultivated as garden, without improperly interfering with regular labour.

I should have considerable doubts, as to the practicability of adding an acre more of arable land to the cottager, under any circumstances, with the prospect of advantage, if the fact had not been ascertained from the unquestionable authority of Thomas Estcourt, Esq. in an account of the result of an effort to better the condition of the poor, &c. (See chap. 4. sect. 4.) The scale of the experiment is too small to admit a general inference, and the local advantages are such as cannot be presumed upon in many situations. It will, however, stimulate the efforts of other gentlemen, in imitation of a most laudable example; and on a mass of experiments, tried under various circumstances, a system may be digested for materially bettering the condition of the industrious poor.

Concluding, that at present half an acre will in few instances be exceeded, and that it will be in most cases sufficient for the labour of one man, without interfering with his usual engagements, I shall draw the plan of a cottager's garden, with the probable method of managing it to advantage.

The ground is supposed to be of good quality, well fenced, and adjoining the house. A small portion may first be allotted to herbs and small seeds; then the remainder parted into three divisions; one for carrots, parsneps, onions, cabbages, borecole, &c.; the second for beans or peas, according to the nature of the soil; and the third for potatoes. The crops should succeed in regular rotation, and the manure always used with the potatoes. The occupier should be supplied with seeds and plants for the first year, after which he may contrive, from his own crops, to keep on a succession, or sell enough for necessary change.

One-third of the ground may appear large, for what are usually called culinary productions; but it is of great consequence, that a poor man's family should be well supplied with vegetables; and if there be an overstock, nothing will be lost, as it will afford a present supply for the stye, and save the potatoes for winter use.

The produce may be calculated as follows:

Beans, after deducting seed for next crop	4½	bushels.
Potatoes, ditto - - - - - -	40	bushels.
Cabbages, and borecole, besides carrots, &c.	500	plants.

	£.	s.	d.
In money, Beans worth - -	1	7	0
.... Potatoes - - -	4	0	0
.... Cabbages, &c. - -	1	10	0
	6	17	0

The advantages appear from this low statement, sufficiently great to encourage the landowner, farmer, and cottager; especially when it is recollected, that no notice is taken of the profits arising from fruits of various descriptions, which are attended with little additional trouble.

ORCHARDS.

On the Cotswolds, except partially on the slopes of them, fruit plantations are not made. In the Vale and Forest districts, they form a very important part of the farmer's productions. Almost every farm has its small inclosure near the house; but situation is not much attended to: the convenience of a spot of ground, without regard to its aspect, is generally the first consideration; hence, orchards are planted on all sides of houses, and have by accident, not design, a north, east, south, or west exposure. Large plantations, however, are necessarily open to the sun, more or less, on every side, except the north; but those which have the morning sun, and are best defended by a skreen of other trees from cold winds, are the least liable to injury, though, under the most promising circumstances, the expectations of the farmer are frequently disappointed. Fruit-trees, indeed, of all descriptions, are subject to such a variety of mischiefs, under the most judicious management, that it is to be ranked among the kindnesses of Providence, that the sustenance of man does not depend upon them.

Blight is the general term, to which the destruction of blossoms and consequent failure of crops, are assigned; but the particular causes may be better explained under the titles of frost, lightning, and insects.

The fatal effects of frost may be clearly traced. Dry frosts, unless very severe, are seldom injurious; but most surely so, when succeeding a storm of rain. Similar effects are probably produced on the vegetable as the human system. Sudden transitions from heat to cold, are uncongenial to either: by warmth the vessels are expanded, and the juices flow freely; a sudden application of cold, causes a sudden contraction, without a proportionate diminution of the fluids, which, being thus unnaturally checked in their current, become stagnant, morbid, and diseased. Rain is congenial to the growth of plants; and while nature disposes them to open all their pores, by which its influence can be received, the consequence of being overtaken by frost, in this situation, must be fatal.*

The moisture of fog is equally mischievous, as far as it extends. In 1802, during the night of the 25th of May, a most promising blossom was cut off. The elm, oak, and ash, were injured at the same time: the line of devastation was precisely marked, proceeding horizontally through the Vale, to the elevation of about thirty-five feet. Trees which grew on higher ground, were not touched. The solution of this phenomenon seems to be, that the fog, which rises more or less every evening, especially after a warm day, was, during the night, suddenly succeeded by a smart frost, which seized the moistened parts to the point of elevation of the fog, and produced the mischief.

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* Dr. Paterson, in his *Observations on the Climate of Ireland*, gives the following explanation of the mode of action by the frost: "The abstraction of heat, or what is called cold, besides its opposition to the adequate fluidity of the vegetable juices, must be unfriendly to the animation of the solids, causing either local canker, or death of the whole plant. When the vegetable fluids are chilled, and converted into ice, their bulk is vastly enlarged, and this enlargement sometimes takes place with such extreme violence, as to rend them in pieces. In this way, frost destroys those parts of vegetables which are most succulent, particularly in that form called hoar frost, or rime, so common in the spring season."

Cold winds coming on after a day of sun-shine, may prove destructive to the blossom. Hence, in a northern aspect, the fruit is often preserved, when in others it has been destroyed; for the sun, not having much influenced the trees in this situation, they are left to the prevailing temperature of the season, and thus enabled to bear the cold north-eastern blasts of the night.

Lightning is a second supposed cause, and among the farmers much believed. An able writer on this subject, considers the opinion as unfounded. If, however, the partial manner in which some trees and hedges are attacked, be attended to, it will be difficult to account for the effect in any other way.* Sometimes a single limb loses all its foliage, and ceases to vegetate in one night: at other times, one tree of many in an orchard; at others, a row of trees in one direction; and sometimes whole orchards are affected in the same way, and recover with difficulty. On the 1st of June 1804, I saw a hawthorn-hedge of nearly 100 yards in extent, forming the western fence of a garden, without a green leaf, and apparently as little vegetating as in winter; while another range of hedge, in the same aspect, and almost adjoining, was green in its foliage. The mischief to the former was done in one night; and it is difficult to assign any other cause than electric fluid, floating in the air, and driven in particular directions. On the same night, the apple-trees suffered a similar and more general attack. The blossom was vigorous, and the prospect promising; but, with few exceptions, they were blasted, and the foliage was changed to a russet hue, distinguishable at the distance of miles; yet the pear-trees were not injured; they had blossomed early, and during a continuance of cold checking weather, and, contrary to expectation, preserved their leaves and some fruit. Why they escaped, I cannot conjecture: as to the apple-trees, had the blasted ones been found only in the lower situations of the Vale, the mischief might have been ascribed to fog, as in 1802; but the orchards on more elevated grounds were equally affected, and there was no frost that night.

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* Lightning, like frost, may affect vegetables by its expansive power, bursting their vessels as it passes through them.

Insects are considered as a third, and principal cause of blight. An intelligent writer observes, that frosty nights, with a north-east wind, in the spring, following a warm day, are particularly injurious to the blossom of the apple; the warmth of the day hatches the eggs of the insect which breeds in it, whilst the coldness of the night, by checking the progress of the sap, retains the blossom in its half expanded state, to form a nidus for them. Blighted trees are covered with insects indisputably; but it is not equally clear, whether they are the primary efficients, or consequences, of the mischief. It is the nature of various insects, to find a nidus in particular diseased plants, without being the cause of the disease. Experiments are wanting to decide the question.

The general opinion of the growers is, that an easterly wind is charged with blight, or the eggs of animalculæ; but this seems to be justified no farther, than as to some mischiefs, following a continuance of cold, from that quarter. If insects, however, in any way are the causes of blight, the only operation which promises an antidote to the evil, is the burning of weeds, and other vegetable substances, on the side of the orchard from which the wind blows. Salutary effects are said to have been experienced from this process. If a little sulphur be mixed with the heaps, the benefit may be increased. The smoke of lime-kilns and brick-works, will probably answer the same purpose.

If insects are the consequence of a diseased state of the tree, smoking will be the most likely means of preventing them from depositing their eggs within the blossom, which will check their increase, and the ravages they would make on the buds and leaves, when hatched in prodigious numbers. Trees growing in or close to large towns, are seldom covered with insects.

Inbred grubs are often fatal to pears, after they have attained a considerable size: a black spot is the sure prognostic of their existence; and if the mischief goes on, the vital parts are destroyed, and the fruit drops, having previously grown into a rounder form than belongs to the pear. Of this, the cause is not known, nor any mode of stopping its progress.

There appears sometimes also, on the outside, a brown mark, as if produced by the corrosion of an insect: this is reckoned a mischief seldom to be overcome. In 1804, however, contrary to expectation and former observation, these wounds healed over, and the fruit came to maturity.

Fruit-trees require pruning; but, to produce any good effect, it must be done with judgment. A notion much prevails among the farmers, that, in every branch which is cut away, so much fruit is destroyed, as might possibly have grown on it: in a tree, however, crowded with branches, the blossoms in the interior part seldom form to fruit, the produce being on the outside. Thus far, indeed, an accidental cause serves to thin the quantity, and improve the remainder; but the better plan would be, to lay the branches open to the influence of the atmosphere, by cutting out those which cross each other, and allowing proper intervals between the rest. The fruit would then be regularly dispersed through the tree, and ample amends made for loss in quantity, by improvement in quality. This should be the annual work in all young orchards, and would save a great deal of future trouble, and even prevent danger afterwards; for when a tree has grown old in a neglected state, much caution is required in thinning out the branches. By letting in the cold air too suddenly into the interior of the tree, mischief, if not ruin, is the consequence; at least, however, four or five years will be lost in restoring a due strength for bearing.

In pruning, it is a bad, though common practice, to leave the stumps of branches which are cut off: they ought to be separated close and even with the trunk, to prevent insects from harbouring between the bark and wood, and by continual irritation retarding the cure; some medicated composition, or even, in want of that, grafter's clay, should be laid over the place.

The time of pruning is also an important consideration: the best writers agree, that the work should be done before winter, not later than November; it is, however, usually deferred to spring.

Misletoe is a great enemy to the health of apple-trees, and yet is permitted, from year to year, to remain attached to the branches, in a slovenly manner, exhausting the vital juices. It should either be removed before winter, or, as it is excellent food for ewes in the spring, *after* yeaning, might remain till that season. If, however, it should be judged more proper to remove it before winter, care must be taken to keep it out of the way of cows and ewes with young, as it has a tendency to make them cast, or warp.

Canker is a disease, probably arising from various causes, but principally from obstructed circulation, and external injury done to the branches by rubbing against each other, biting of cattle, stones, &c. The mischief is generally suffered to go on, till the branch is decayed, which is then chopped off with the hatchet. If the branch, however, be worth saving, it may be done, as recommended by Mr. Bucknell, by cutting the cankered part completely out, and covering the wound with a medicated preparation, composed of half an ounce of corrosive sublimate, dissolved in an ounce of spirit of hartshorn or wine, and then mixed up with about three pints of tar, in an earthen pipkin, and stirred long enough to make the mixture complete.

Some fruit-trees canker without any external injury, but from internal and radical disease, owing to the age of the species, or bad formation of the fibres and sap-vessels; such are codlins, carraway russets, woodcocks, orange pippins, &c.

Moss is said to be an indication of weakness, if not of disease, and requires nice attention to prevent or eradicate. It is recommended to wash with soap-suds, and rub off with a brush; and this in wet weather, when the moss is soft, and easily separated. This should be begun at an early period of their growth, when the branches are few, and open, and repeated every season; otherwise the labour will be too great to undertake on a large scale, when the trees are full headed, and entangled with shoots. The orchardist, however, should not be discouraged easily, since it has been discovered, that the eggs of caterpillars are lodged between the moss and rind, and probably issue forth from these depositaries in the spring, to the destruction of leaf and blossom.

Moss is attributed to the plantations being made on grass lands, the common practice in a great part of this county. It is said, that in the neighbouring counties, where the orchards are planted in hop-yards and arable fields, the trees, though not free, are less affected by it. This may be owing to the frequent manuring and stirring of the mould near the roots, by which the sun and rain have power to exert their influence, and, by invigorating the fibres, promote a general kindness in the growth.

If orchards are continued in a pasture state, it is a good practice to dig out a circular space of ground, to the extent of four or five feet from the stem of the tree, early enough in the autumn to receive the rains and frosts of winter. By this exposure, the subsoil, having first been moistened, is pulverized by the succeeding frost; and if thoroughly rotten dung, or fresh soil, be put in with a thin layer, before the turf is replaced, very beneficial effects may be expected. An orchard of a large extent, in the neighbourhood of Gloucester, which had borne but little for some years, was rendered flourishing and vigorous by this process.

Soil. Experience proves, that the strength of the liquor depends much on the strength of the soil. Fruit which grows on a clay, produces a powerful liquor, though sometimes austere and unpalatable; whereas that which is produced on a light, sandy soil, proves thin, but more agreeable to the taste. This fact is so well ascertained, that scions taken from the same tree, and grafted upon stocks growing in soils of different qualities, produce liquors differing in flavour and strength. The styre apple is most esteemed in the Forest of Dean. The soil is a reddish loam, on a lime-stone rock. The same apple is grown in many parts of the county; on clays, it is good for little; on sands, it retains something of the flavour, but loses in strength; but the flavour and richness of genuine styre, is only produced on the soil of the Forest district.

The Longney russet is no where found equal to that which grows on its native soil: it will thrive almost every where, and produce a strong liquor; but no where with that combination of strength and softness, as at Longney.

The squash pear, under good management, furnishes a fine perry on all strong soils; but possesses superior qualities when growing on its native soil, at Tainton.

Other fruits appear not so much attached to a particular soil, but flourish with equal advantage on soils of the same general character. Thus the Hagloe crab, though a native of the Forest, is grown in pretty high perfection on strong argillaceous soils.

The soil which appears generally best calculated for all sorts of fruits, is a marly clay, or loam; and the worst, where the clay predominates so much, as to keep the roots always soaking in a bottom of stagnant water, when planted deep.

The supposition of an able agriculturist, that the pear, being naturally saccharine, delights in a soil totally deprived of calcariosity; while the apple, abounding with acidity, thrives best among calcareous earth, the natural destroyer of acidity, seems too refined, and not supported by fact; otherwise, the best situations for apple-orchards, would be found on the Cotswolds; but in truth, apples and pears are indiscriminately planted on the same ground, and flourish so equally, as to make it difficult to say, which has the superiority.

In replenishing an old orchard, or replanting a new one on the same ground, it is esteemed a bad practice to plant the stock on the spot where the old tree stood; but it is otherwise, if a pear be planted where an apple grew, especially if the surface and subsoil be well dug and manured.

Process from sowing the seed to transplanting into the orchard;—The "must," or substance, which has been squeezed in the press, generally furnishes abundance of kernels for the seed-bed. These are sown either in autumn or spring; the latter is most practised, because, during the winter, mice and other vermin prey with avidity upon them. The ground, having been previously well dug, and trenched, (or doubly dug,) where there is a sufficient depth of soil, is ready for the seeds, which are scattered pretty thickly over the surface, and raked in: weeds are carefully kept down during the summer; and in the second or third autumn, the young plants are fit to be transplanted. The ground of the nursery is dug with the same care as the seed-bed, and, at the time of removal, the roots are pruned, by taking off the tap, or down-striking roots, and shortening the fibres. They are planted in rows of three feet, and about eighteen inches from each other. In this mode of plantation, 9,522 stocks will be raised on an acre, or thereabouts. They are continued in the nursery about ten years, and will then have attained a size proper for transplanting into the orchard ground. While in the nursery, they are kept regularly pruned and trained: the side shoots are cut off, and one neat and upright stem preserved, with six or seven shoots at the head. In this state, the present price is 1*s.* 6*d.* a piece for apple-stocks, and 2*s.* 6*d.* for pear. The profit of an acre of ground thus employed, is very considerable: 9,522 stocks sold out at the prices before mentioned, amount, in the first case, to 714*l.*; in the second, to 1,190*l.* 5*s.*: and after the third year the profit may be reckoned as neat, since the occasional crops raised in the void spaces between the stocks, will pay the expences of labour and rent.

The stocks, having arrived at the height of six or seven feet, and about five inches in circumference, are planted in the orchards; if pasture, at the distance of ten or twelve yards from each other; if arable, from sixteen to eighteen or more, with an interval of twenty or more, and opposite to each other: the distance of the rows, however, depends much on the width of the ridges, as on the top of these they are planted: if the ridges are small, every other one is omitted; otherwise if they are wide, managing in such a way, that the last-mentioned distance be nearly observed. On pasture land, the quincunx order is practised, that space may be gained for the spreading of the heads, the distance that is allowed being less.

The practice of planting on tillage lands, prevails chiefly in the Forest district; at least much more than in the Vale, on the east side of the Severn. Besides the advantage supposed to arise from manuring and keeping the mould loose over the roots, there is a considerable saving of expence in the article of fencing. Young trees must be protected from external injury, till they have gained a considerable state of growth, become firm in the roots, and hard in the bark. Where the only danger to be apprehended is from the violence of the wind, three stakes judiciously placed at eighteen inches from the lower stem, and meeting about half way up, and there fastened with twisted hay, (" a hay-band,") will be sufficient; but where cattle are to range, a more expensive mode of defence is required, as will be seen hereafter.

Apple and pear-trees are often seen growing in the hedge-rows; but this is not to be considered as the practice of the county, but only of a few individuals. In some late inclosures from the waste, trees have been planted in this way; and the reason assigned is, to save the expence of fencing; for being set in with the quick, the same protection serves for both; and when the hedge wants no further fencing, it will be high enough to save the young trees also. It is, however, to be questioned, whether the small saving of expence will balance the mischief done to the hedge. (See chap. 6.)

The appearance of fruit-trees in the hedge-rows, generally speaking, is assignable to another cause. In a country were fruit is sometimes abundant, the kernels are variously distributed by birds, and in other ways. They sometimes fall in a hedge-row, and, being there protected, grow up with the hedge; or crab-quick is often intermixed with hawthorn sets, that are collected in the woods. If a young stock of promising appearance grows up in such a situation, the farmer is sometimes induced to graft it; but more frequently the fruit-trees in the hedge-rows are wildings and crabs, no otherwise valued, than as they assist in mixing with inferior pears, for family drink.

February is the usual month for planting, though something depends on the season and soil. A long series of drought is inimical to late planting, as severe frosts are to autumnal. It is, however, less trouble to protect the roots during the winter with loose straw, or "muck," (half rotten dung,) than to be continually watering through a dry summer.

On light and loose soils, less care is required in planting than on clays. On the former, it is enough to dig out a hole, just deep enough to cover the roots, and return the mould as it came out; but on the latter, the digging of a hole is ruin to the plant, as the whole depth below the cultivated soil is so retentive as to form only a reservoir of water; and even if it be filled with good mould, it is impossible for the roots to extend themselves into the surrounding clay. The practice, therefore, is, to take off the turf in a circle of about four feet diameter, and lightly to stir the subsoil; on this to place some good earth; then to plant the stock, with another laying of good soil upon it, and over all to place the sod, *generally*, upside down. The tap-roots are previously cut off, or shortened, and also the fibrils are pruned at the ends, and, being placed in regular order, have some new earth mixed and shook among them. Before planting, the stock is headed down; at least the branches are shortened to six or eight inches, to prevent the power of the wind, and throw the juices more into the stem, thereby increasing its vigour.

The next step is to defend the newly planted stocks from being injured by cattle, or other means. The following methods are in use.

1. Four posts, either sawed or rended, and high enough to be out of the reach of cattle, are placed upright at right angles about the stock, forming a square of three feet to each side; against these are nailed five or six tier of rails, near enough to each other to prevent the heads of cattle reaching between, and also near enough to the ground to keep sheep from rubbing the stock, than which nothing would be more injurious.

2. Three posts are set up triangularly, with similar courses of rails.

3. The two pieces of a large post, sawed lengthways, are placed with their flat sides towards the stock, so as to be two or three feet apart. Against the edges of these, rails are nailed to the same height as before; but the rails

being not more than five inches from the stem, the bark is liable to be damaged from agitation of the wind: to prevent which, in some measure, the upper rails are often made of hoops or bended willow, by which proper room is allowed for the waving of the stock, without danger of being chafed.

4. A bundle of thorns is tied round the stock with tar rope.

5. White hawthorn *(cratægus oxyacantha)*, or wild brier *(rosa canina)*, is planted about the stock.

6. Another mode is, to twist a brier spirally round the stock, from bottom to top, and down again.

7. The last is by three stakes, as before mentioned.

Of the three first, the four-post fence is the most secure, and the strongest, but most expensive. The second does not remove the stock far enough from the exterior, and consequently is not quite out of the reach of large cattle. The third is still more liable to this objection. One mischief is said to be produced by all; namely, that the posts, being loosened at the base by the agitation of the wind, or rubbing of cattle, form so many holes, into which the moisture is drawn from the roots of the stocks.

The fourth is a cheap and good fence, if carefully watched and repaired; but for want of this attention, many trees are ill-preserved, and go on slowly with a stunted growth. Cattle are fond of rubbing against thorns thus tied together, and still more fond of tossing them with their horns, thus preventing the plant from settling, and opening the fence at the bottom to the attacks of sheep.

The fifth is found to answer the purpose well, particularly the wild brier, or dog-rose: this grows rapidly, shooting ten feet in a season, and cattle are deterred by the prickles from touching it; besides that, it will bear the shears, and may easily be kept within bounds. The hawthorn grows too slowly, and cattle eat the young shoots too eagerly, to render the use of it unobjectionable. Perhaps the application of it, according to the sixth mode, is the best of all. Cattle will not rub against a tree thus armed; and the only objection which can be made to the brier in a state of growth round the the stock, is here obviated; it can draw no nourishment from the roots of the plant it was intended to preserve, which, in the other case, may probably be the fact. The brier requires frequent renewal.

The seventh method will keep the stock steady to its place, but is not a preservative in any other way: it can only be adopted in plantations not accessible to cattle. Even in tillage lands, however, some planters have found it, by experience, necessary to use the four or three-post fence, to keep the plough to a proper distance from the roots.

Grafting. When the stocks have been three or four years in the orchard, they are ready for grafting, which is performed in the following way. The heads of the stocks are taken off with a saw, and then smoothed with a keen knife: the height depends on the fancy of the planter, though generally seven feet; a cleft is then made across the centre of the stump, and kept open with a wedge of wood, (" a clate,") while two scions are inserted, one on each side: the wood being withdrawn, the parts close, and keep the grafts firm in their places. One graft would be sufficient to form a head large enough; and it is the practice of some planters to remove the least promising of the two, where both strike, the next spring, and with a sharp knife or chissel, pare off the top of the stock in a sloping direction to the remaining graft; this prevents water from lodging, and the sap is then directed to and concentred in a smaller compass. It is proper, after this operation, to renew the compost of clay and chopped hay, which was worked round the grafts after their insertion, in order to bring on a more speedy healing of the wound, by preventing the bark from being dried by the sun and air, or annoyed by insects.

When both grafts are suffered to grow, the head, being double, is often separated, and the trunk rended by strong blowing winds, or even the weight of the branches. In old trees of this description, the branches often separate in the same way; and where it is foreseen and apprehended as likely to be the case, a wooden frame is fitted to the branches, just above where the grafts were inserted, which keeps them together.

The grafts are secured immediately after the compost is put on, with "braids." These are open wicker baskets in the form of an inverted cone, fitting the stock below the place to which the compost extends, and rising about two feet high, and expanding at the top to nearly the same diameter. This contrivance serves not only to guard the grafts in their early state, but also to keep the shoots to a proper compact form of growth. The practice chiefly prevails on the banks of the Severn, where the osier *(salix viminalis)* is grown in great abundance. If the grafts do not strike, it is dangerous, if not fatal to the stock, to insert new scions, till the third or fourth year. If they do strike, the planter seldom takes any farther care, till the tree begins to make some return: this neglect is observable most frequently, where the landlord, living at a distance, leaves the managment to the tenant, who probably, having a short interest in the estate, feels little anxiety about the distant improvement of it. Many land-owners in the occupation of their own estates, and some tenants, more intelligent and spirited, more attentive to their landlord's interest, and less sparing of trouble, carefully watch the progress of the shoots, and, by cutting off straggling, useless branches, prevent the interior of the tree from being encumbered with a redundancy of wood.

Crown grafting is often practised also on the branches of old trees. When from age or other causes the head begins to fail and die at the extremities, it is cut off near the bottom of the principal branches, in whose stumps the scions are inserted. It is not unusual to see a single stump bearing eight or ten grafts, and in the whole tree from fifty to a hundred. Good heads are formed by this method, where the grafts are not used in too great abundance; and they come into bearing much sooner than young trees. A stock, from the time of its being grafted, will not probably bear a bushel of apples in twenty years; whereas an old tree, grafted in this way, and properly managed, will bear three times the quantity in half the time: in point of durability, however, it is inferior; and therefore the practice is confined to single detached trees, and not extended to whole orchards.

A mode of grafting, I believe, entirely new, has been discovered, and is now practised, by Richard Browne Cheston, M. D. of Gloucester, which promises great advantages. When the stocks are arrived to a proper age for planting out, the ground is opened about them, and they are separated from the largest roots; of which such are chosen as are of a sufficient size for cleft grafting, which mode is to be preferred; and if the roots are inclining, they are raised to a perpendicular, without disturbing their extremities in the ground; the scion is then inserted, and secured in the usual way. The earth is thrown around them, and one bud, or two at most, to guard against failure, are left above ground, which will be found to strike with astonishing vigour. If both succeed, the least promising is removed. The buds which are covered with earth shoot out into roots, so that when the trees are to be removed to their destined situation, they may be entirely separated from the original root on which they were engrafted. To the parent stock, sufficient roots remain for its future support, and it may be planted elsewhere, either for the purpose of producing a fresh supply of roots for the same process, or for grafting in the orchard. Some grafts, which were thus inserted in 1800, were handsome trees, eight feet high, in 1804, and had fine fruit on them.

Six of the stocks, which were separated from the roots in 1800, and then esteemed useless, were replanted, and in 1804 had kernel-fruit upon them.

A method of root-grafting is mentioned by Agricola, but different from the foregoing. "A graft, or scion, is taken from a young tree, and a small piece of the root of another tree of the same kind, or like it; or else, pieces of roots cut off from other trees in transplanting: these are whip-grafted together, observing that the two butends of the graft and root be united, and that the rind of the root join that of the graft, then plant the root with part of the scion under ground." This appears to be an inferior practice to the new one, because one season is probably lost by the check occasioned by the taking up and re-planting the root; though it is entitled to considerable attention.

Fruit-trees, managed in the usual way, come into bearing in six or seven years after grafting; but the quantity of fruit is inconsiderable for twenty years, as before observed: after this period, the produce increases, till the tree is fifty years old, at which period it will bear from ten to fifteen bushels, and is supposed to be near its point of perfection.

An apple-tree will continue to bear well a hundred years, or more, from this period; and a pear-tree much longer.

A pear-tree is now growing at Minsterworth, which, according to the proprietor's account, is at least three hundred years old. It is an inferior species of squash; vigorous, sound, and flourishing, and has been so in the memory of the oldest man in the neighbourhood: 340 gallons of perry have been made from its fruit in one year, and will probably again, in a favourable season.

Five pear-trees in the same parish, have more than once borne fruit enough to make together 1100 gallons.

CYDER MAKING.

The process of cyder-making is nearly alike every where, but there is much difference in the degrees of attention: the great art in the first part of it, lies in well grinding the fruit, and breaking as many of the kernels as possible, as from them the liquor receives a principal part of its agreeable flavour. The fruit ought to be fully and equally ripe; otherwise the fermentation cannot go regularly on. Were the apples left to fall off of their own accord, there would be little fear of producing a good vinous liquor; but this would be too tedious for a large plantation, and is therefore not the practice. The farmer, however, is well aware of the fact, and endeavours to imitate the operations of nature in managing the fruit, after it is gathered.

In gathering, the earliest fruits are of course selected first; but as, even on the same tree, they are not equally ripened, they are thrown together in a large round heap in the open air. In this state they remain for a considerable time, till a sweat or kind of fermentation has taken place, which brings the whole quantity nearly into a similar state of mellowness and preparation for grinding. This process, or at least to know the period when it has been carried far enough, requires judgment; but under the best management it does not always succeed, much less can it cure the injudicious haste of those who, without regard to maturity, indiscriminately run over the whole orchard with the beating pole, or "lug," and bring down every apple within their reach. This practice of beating the trees, before the fruit is nearly approaching to ripeness, is not only injudicious with regard to the cyder, but also injurious to the next year's crop. The bearing bud for the succeeding season, is formed early in the summer, and near, and even attached to, the growing fruit. The consequence of beating the trees, unless the apple separates easily, is the bringing off the bud with it, which nature had provided for the ensuing year. After an operation of this kind, the ground is strewed with these buds, to an extent scarcely to be conceived by those who have not witnessed it. The more careful farmer, has the trees shaken limb by limb, by a person up in the tree, only beating off the few that remain, and sometimes even allowing them more time to ripen. This is by far the best practice, except that of suffering them to fall of their own accord, and generally ensures a regular fermentation, and with less heaping. The nearer the fruit approaches to maturity, the richer is the juice; for heaping, though it improves unripe fruit, cannot communicate the richness found in that which is fully ripe.

The effect produced on apples thus heaped in a very green and unripe state, is rottenness; and, under the best treatment, some of this description will appear: where good cyder, however, is intended to be made, not one of these is used, a very few being capable of giving an unpleasant flavour to a large quantity of liquor; especially if they have become black.

The fruit being thus prepared, is carried to the mill, of which two sorts are in use, the horse-mill and hand-mill. The latter is chiefly used on small farms, which have not plantations sufficient to repay the expence of the former.

The horse cyder-mill is composed of the following parts: the cistern-chase, or trough, the runner or bruising-stone, cog-wheel, and upright axle-tree; with the stirrer, reever, and shovel, used in the process.

The cistern is circular, and of stone, hollowed out to fit and receive the runner, usually to the depth of nine inches. On the inner side, next the "nut," or central space, it is cut perpendicular; but on the exterior, it is somewhat sloping, being wider across at top than bottom. The upper edge, on the outside, is left two or three inches wide, to receive some wood work, called "curbing," which raises it four inches higher, and finishes nearly with a sharp edge. The intention of this wood work is not only to prevent the pulp from being carried over, as the stone rolls, but also to correspond with a four-inch plank or planks, which cover the nut, or circular vacant space in the centre. The cistern is delivered from the quarries in three or four parts, which are fitted and cramped together by the mill-wright. A mill of common size will require a cistern of thirty feet in circumference; the price is charged according to the number of gallons it contains, or at a guinea per foot diameter.

The runner, or bruising-stone, is seldom less than three feet and a half, or more than four feet and a half in diameter. It is perfectly flat on the side next the nut, and a little convex on the other, nearly fitting the bottom of the cistern. A strong axle of wood is fastened through it, connected with an upright or standard axle-tree in the centre, and extending far enough from the exterior side of the runner to connect, by means of an iron rod, with a wooden bar, which is also linked to the upright axle, and to which the horse is fastened: this wooden bar is before the runner, and keeps the horse clear of it. The height is regulated by a substruction of stone work under the cistern.

A cog-wheel of eighteen inches, or two feet diameter, is fitted to the horizontal axle, and runs on the wood work, which covers the whole space, from the interior edge of the cistern to the perpendicular axle, and is called the nut. The exact height of this wheel, will of course be determined by that of the centre of the runner above the nut. The cogs of this wheel catch upon upright teeth, fixed in the nut, as it rolls upon the surface, and force the stone to a rotary motion, which otherwise it would not always keep; for when the apples are first put in, or the bottom of the cistern has become smooth from the pulp, it might slide along rather than roll, without some machinery of this sort: some mills, however, are without it.

The runner and cistern are had from the Forest of Dean; the former is sold at the quarry at one guinea per foot, or as many guineas as the stone measures feet in diameter.

The perpendicular axle-tree has an iron pin at each end for pivots, which run in a sunk iron centre; and the wood of the axle, which is bound with an iron ring, forms the shoulder.

The stirrer is a strong stick, with which the fruit is kept to the stone, and removed from the sides to the bottom, during grinding. A woman, or boy, walks before or after the horse, continually moving it.*

The reever is a piece of board fixed to a wooden handle, and made to fit the form of the cistern; with this the pulp, when sufficiently ground, is drawn together, and then carried to the press with a wooden shovel, or scoop. Some make use of an iron one; but it is supposed that the acid of the liquor dissolves a portion of the metal, and possibly produces the black tinge, which is frequently observed in cyder, after it has been exposed to the air. Whether this supposition be right or not, wooden implements are more cleanly, and to be preferred.

About two bushels of fruit are usually thrown at one time into the cistern, which, when ground, are removed to the press, and succeeded by other quantities. From five to six bags of four bushels each, or from ten to eleven "seam," of nine pecks each, of juicy fruit, are generally sufficient for a hogshead of 100 gallons wine measure.

The hand-mill consists of two wooden cylinders, toothed or indented, about nine inches diameter each, inclosed in the way of other mills, with a feeder at top, and is turned by hand. This, though in some respects inferior to the horse-mill, has its advocates and uses. The operation of bruising the rind, kernel, and stalk, as well as reducing the fleshy parts to a perfect pulp, is well performed by it. The cylinders, being so disposed as to be capable of being removed to a greater or less distance from each other, the work goes on in regular progression, from the first cutting of the apple, till the cylinders are brought so near to each other, that scarcely a kernel can pass without being bruised; and the effect is improved, where another pair of fine toothed cylinders works under the first, receiving the pulp in a coarse state, and passing it through in perfect fineness. This addition gives a considerable saving of time, but requires more strength. The same degree of fineness is with difficulty produced by the horse-mill; for in spite of the constant attention of the person who stirs the fruit, while it is grinding, and keeps it to the runner, a considerable portion is carried to the press in an unreduced stated. Two disadvantages will, however, attach to the hand-mill in its present state, loss of time and increase of manual labour. It is difficult, with the assistance of three men, to grind a hogshead in a day: with a horse-mill, from two to three hogsheads may be made by a man and woman, or younger person, and a horse: on a large fruit farm, therefore, its superiority is decided.*

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* I have seen horse-mills, which have two stirrers so attached to the axle of the runner, as effectually to perform this business without manual assistance.

Pressing. The pulp is either immediately carried to the press, or, which is the better practice, laid up in tubs or open casks for twenty-four hours. This improves the colour, and, by digestion, produces a more intimate union of the rind, kernel, and stalk juices, especially if again carried to the mill, and re-ground. The cyder-press differs little in its general construction from those used in other processes, where strong pressure is required. It consists of a cistern-sill, vat, cheeks, or "sisters," cap and screw, lanthorn, bridge, press-blocks, shooter, lever, windlas and rope.

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* The hand-mill, however, is capable of great improvement in point of expedition, by the application of a large horizontal wheel and horse, as in some manufactories.

The cheeks, or "sisters," are two strong upright pieces of oak, kept to their places by being let into the ground first, and then by the cistern-sill, which is a thick piece of timber reaching from cheek to cheek, near the ground, at each end open mortised, resting on a shoulder, and clipping the upright: through these open mortises and the upright, a strong iron pin is passed, which prevents the cheeks from spreading in the act of pressing. A correspondent piece is placed near the top, mortised and fastened in the same manner to the cheeks, through the centre of which is made the female screw, or nut, which is then called the cap.

The vat is a wide plank, with a groove running round it near the edge, or, which is better, a raised bevelled border coinciding with the edge, about an inch thick, to prevent the liquor from running off the sides, and to conduct it to the sluice or spout, from which it passes into the receiver. This vat is fixed firmly on the cistern-sill, and in some instances is *still* covered with lead, notwithstanding the danger of its being corroded by the acid of the liquor, and the well-grounded opinion of its having occasioned cholics, and other disorders, to the drinker.

The screw, if made of wood, is usually nine or ten inches in diameter, and, passing through the cap, rises three or four feet. To the lower end, which is square, is hung by a rounded pin the bridge, which is a plank reaching from cheek to cheek, and moving freely up and down, but kept to a regular position by open mortises. The lower end of the screw is left of a larger diameter, if the lever is intended to work in it, and is then perforated and hooped with iron, but more often the lanthorn is fixed on it. This is made of two circular pieces of wood, less than two feet diameter, kept eight inches asunder by ten strong pillars, between which a piece of ash or elm timber is occasionally placed, called the lever. Two of these belong to the press, and are used according to the power required. One is shorter and less strong than the other, and may be worked by the strength of one man, during the early pressing; but when the liquor is nearly exhausted, another, longer and stronger, is applied to the lanthorn, and worked by the windlas, which is an upright post turning with an iron pivot in a socket on the ground, and, passing through a beam rather freely at top, is removeable when not wanted. A rope coiled round this windlas, is hung by a loop to the end of the lever, and there secured from springing off by a wooden pin. The windlas has also, at a proper height, two or four bars of wood, passing through for handles, to which the strength of four men may be applied with great effect. The press-blocks are pieces of oak, about two feet long and six inches square, placed one above the other, crossing in alternate pairs, under the bridge, for the purpose of keeping the lanthorn, lever, and rope above the heads of the workmen at the windlas.* Price of the press about ten guineas.

On the vat is spread a hair-cloth, manufactured for the purpose, from a yard to four feet square. On this a sufficient quantity of pulp is placed, so as to leave room for the cloth to be turned up at each side and corner, and nearly meet in the centre. The size of the "cheese," as it is now called, and its form, are usually determined by a wooden frame or guage. The first cloth being filled, and laid even, another, and so on to ten or twelve, are placed over each other in regular layers, the square frame being raised with them, and keeping the pile to an uniform size: on all these is placed a strong board, wider than the pile, and on this the blocks. The screw is then lowered, and at first a gentle pressure made, which is gradually increased, as the cheeses become drier, and at length completed by the long lever and windlas. The cheeses are then taken out of the cloths, and, if not designed for farther use, thrown away: if, however, the crops are scanty, the "must" is laid by, and re-ground with water, from which is produced a liquor of weak quality, called "washings," though sufficiently strong for family use; for notwithstanding every attention in grinding, and the utmost exertion of the press, some parts of the fruit remain unbruised, and a portion of juice unexpressed. The residue of a quantity sufficient to make three hogsheads of cyder, will yield about one hogshead of washings. The arrangement of the buildings for the convenience of making and storing fruit liquors, is a matter of great importance, though little attended to on old farms. The mill and press are often found in an insulated building, distant from the cellars. This occasions the employment of a man and boy, with a horse and dray, to carry the liquor to the place where it is intended to be casked; a labour which would be unnecessary, were the mill-house and cellars attached. In some modern erections, the spout of the vat discharges the liquor through an aperture of the wall, into a receiver within the cellar; from whence it is easily distributed to the different casks.

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* Iron screws are coming much into use; these are either cast or wrought; the price of the former is about 2*l*. 15*s*.; of the latter, nearly 10*l*. The power is supposed by some to be increased by the fineness of the threads in the iron screw, though others will allow no other advantage but durability.

Casking. The liquor being carried to the cellar, and "tunned" into casks of various dimensions, according to the fancy or opulence of the farmer, is left to ferment. It is generally allowed that the strength is preserved, if not increased, by a large quantity being kept together in a body. The general size of casks is 110 gallons; they are made as high as 400 or 500; but the former alone are sent out with cyder sold. The price of a cask is now about 5*d.* per gallon. There is a difference of opinion as to the propriety of filling the cask to the bung-hole; but this, it would seem, will depend in a great measure on the tendency of the liquor to fermentation: if that be too quick, the more the surface is exposed, the more it is checked. This is proved by experience; for sometimes the fermentation is so rapid, that it is necessary to draw off the whole into wide tubs, for the purpose of extending the surface, and by exposure to the air, to lower the temperature, and produce a check. In this state the fermentation ceases. The object is in some degree attainable, by leaving the cask unfilled, with an ullage. If the fermentation be too slow or weak, it will be increased by filling the cask; but no fermenting substance is used with cyder as with malt liquor.

To ascertain whether the liquor is above or below temperature, and, consequently, whether the fermentation be regular or otherwise, rests on the judgment of the farmer, as no thermometer or other instrument is used; on this subject, therefore, much more is left to chance, than ought to be on so valuable a produce.

Among the generality, the principles and process of fermentation are little considered, and less understood. When the liquor is lodged in the cask, many think the business over, at least for two or three months, when, according to ancient practice, it ought to be racked, and removed into a clean cask; but whether, after this racking, it be quiet or on the fret, is not regarded: no more is done, and if the cyder turns out harsh and disagreeable, it is imputed to chance, or the badness of the season, and kept for family use. With some, however, the process of fermentation is become more a matter of science and observation, and neither pains or expence are spared to preserve the rich and saccharine qualities of the liquor, and prevent the acetous fret from coming on.

However opinions may differ in the mode, all who have considered the subject systematically, allow, that there is a moment when racking ought to commence, and which, once gone by, can hardly be recovered. Hence, in the management of the finer liquors, whose fermentation is rapid, some have servants constantly watching the progress, and racking, if necessary, even in the night; for, the more saccharine the liquor, the sooner it becomes acetous, unless timely checked. Cyder dealers in the country usually purchase squash and Oldfield perry from the mill, and ferment in their own cellars, and under their own inspection. These liquors are seldom found rich, sound, and well flavoured, under the management of the farmer.

If the liquor be of good strength and body, and the temperature proper, a fermentation begins almost immediately after casking; and in about forty-eight hours, the extraneous substances, which have been tunned with the liquor, will have arisen to the surface; at this moment it may be drawn off perfectly clear; but if neglected, the crust soon breaks, and the whole is thrown into confusion, though a subsidence takes place afterwards at the bottom, but the fermentation is renewed, and racking or exposure becomes necessary according to circumstances.

The lees, or grounds, left after racking, are strained through bags made for the purpose, of coarse linen or hempen cloth, from which the runnings are perfectly clear and transparent, and, being mixed with the liquor in the cask, assist very much in checking an irregular fermentation. Hence it would seem, that fermentation is occasioned by the internal struggle of the liquor, to get rid of extraneous substances or feculencies; the first attempt is to throw them off at the surface; and, in failure of this, to sink them to the bottom.

Frequent rackings have certainly a tendency to reduce the liquor to a quiet state, but the strength is thereby much lowered; for the alcohol, or inflammable spirit, is continually escaping by exposure to the atmosphere: if, however, from causes unknown, the liquor continues in a turbulent state, it is necessary to incur the risque of lowering its strength, rather than have it reduced to an acetous state, which is the consequence of a continued fret. Brandy, or any other clean spirit, will often check the fret; but this is now become too expensive a remedy for common use.

When the fermentation appears to be pretty well conquered, previous to the last racking, the cask, being made dry, is prepared by fumigation, with pieces of linen cloth dipped in brimstone, and suspended from the bung-hole in the cask, as long as they will burn. The vessel is then close stopped, and, two or three hours afterwards, is filled; after this the fermentation seldom returns. The bung-hole is closed; but for fear of accident, the vent-hole is left open for a longer time; and in the spring following, the cyder is fit for sale, and the best part of it goes into the factor's hands for town consumption and exportation.

Pears. The observations which have been made on apples, will in general apply to pear-trees. The mode of raising, grafting, planting, &c. is the same; but in the management of the fruit there is a difference. Both apples and pears are supposed to keep without rotting, according to the quantity of juice they contain. Hence, that sort called Russets, and Morland-pippins, being of a dry nature, may with care be preserved till the middle of the following summer, or even to the spring twelvemonth after they were gathered. All pears are more replete with juice than apples, and therefore go sooner to decay; and the greater part of those which are ground for perry are so juicy, that it is necessary to take them directly from the tree to the mill, otherwise they become "sleepy," and lose all flavour.

The juice flowing in copious quantity from pears, soon fills the hogshead, and, in a given time, gives out double to what apples afford; so that it is not uncommon to make two hogsheads from a tree, and from three to four in a day, at one mill.

After-management is nearly the same as with apple liquor, but no "washing" perry is made, because the fruit being so easily reduced to pulp, leaves no unbroken pieces to be re-ground.

Apples and pears. All the common sorts grow in the county, beside some peculiar to it. The favourites are White-styre, Hagloe-crab, London or Golden-pippin, Longney-russet, White-must, Woodcock, Foxwhelp, Redstreak, Orange-pippin, Morland-pippin, Lemon-roy, Gilly-flower, Spreaders, Cadbury, Cockagee, Grumas or Gromedge-pippin, Hard-head or Kill-boy, Edging, Broad-eye, Under-leaf, Ashmeade's-kernel, House-end, Bromley, Royal-wilding, Dimock-red, &c.

The White-styre is the boast of the Forest district, and, under proper management, affords a cyder so rich and strong, that it is often valued equally with foreign wine, and sold at extravagant prices.

The Hagloe-crab, so called from the hamlet of the same name in Awre, where it was first raised, produces a powerful and highly flavoured liquor; in the most plentiful seasons, seldom sold for less than 1*s.* per gallon.

The London, or Golden-pippin, well known every where; it is said to grow in more abundance in the hundred of Berkeley than in any other part of the county. The cyder made from it, is extremely delicious, but is seldom to be had unmixed with other fruit. Indeed, it were almost to be wished that an apple so scarce, and highly palatable, were reserved for the use of the table alone.

The Longney-russet, so called from the parish where it was first raised, and where it is now grown in great perfection, produces a liquor, strong, rich and grateful, little inferior to foreign wine.

The White-must, Woodcock, Foxwhelp, and Redstreak, are fine old fruits, now going off, and afford the best cyder, when mixed in the mill; the proportions have never been defined, but depend a good deal on the quantities to be ground. The same may be said of the Gillyflower, Spreaders, Cadbury, Broad-eyes, and many others.

The Orange-pippin makes a good cyder, but, on account of its demand for the table, is seldom sent to the mill.

The Morland-pippin is a valuable apple for all purposes; it keeps remarkably well, and is therefore very seldom ground. With care it may be preserved in good condition till the latter end of May, and has been found sound and palatable some months after. The price is generally as high as 6*s.* a bushel from the tree, and much higher later in the season. Hence, it best answers the purpose of the grower to sell them for the table, and large quantities are of consequence carried up and down the Severn, and distributed through the northern parts of the island and South Wales.

The Lemon-roy is a fine large apple, not much valued for cyder, but chiefly raised for the table; keeps as well as the last, and is of finer flavour. It is a great favourite on the western banks of the Severn, as being a free grower and almost certain bearer, and forms a valuable article of commerce to the planters.

The Cockagee is originally from Devonshire, or Somersetshire; but now a good deal is planted in the lower parts of the county. It gives out a strong rough liquor, which may be much improved by mixture with other fruits of a less austere quality.

The Grumas, or Gromedge-pippin, is grown chiefly in the lower part of the county, and makes a tolerably good cyder, but is more esteemed for the table.

The Hard-head, or Kill-boy, is of a middling size, and is used for all purposes except eating. It keeps well, but is peculiarly unpleasant to the palate; it is chiefly found in Tytherington, and the immediate neighbourhood.

The Edging is a good bearer, and a delicious apple for the table, but not otherwise much esteemed.

The Under-leaf is an excellent bearer, and the inside of the tree is generally full of fruit: the cyder, however, though pleasant, is thin and weak. A good tree will often carry twenty seam.

Ashmeade's-kernel is a native of the county, and valuable for the supply of the table, as well as cyder.

The House-end, not unlike the Redstreak, takes its name from having been first raised at the end of a farm-house. It is an useful apple, and keeps well. The mother tree is now growing at Hunt-court, in the parish of Badgeworth.

The Bromley is a fine fruit for the table, and makes good rough cyder. It blows late, and is kind in the wood.

The Royal-wilding, a native of Dimock, is a free, clean, and handsome grower; makes excellent cyder, is a great favourite among the planters in the upper part of the Forest district, and is much introduced in the Vale, on the east side of the Severn.

Besides the sorts mentioned, there is almost an infinite variety, every year almost producing a new species; but for cyder, the eight first, and the last, on the list, are not exceeded.

Pears. Squash-pear, Huffcap, Sack, Oldfield, Red-pear, Bareland, Hartpury-green, Black-winter, Marsh-pear, &c.

The Squash-pear produces the most esteemed perry: it requires nice management; but if the process of fermentation be rightly conducted, it may well be called the champaign of England. This pear is found in the highest perfection in its native soil of Tainton; in almost all other parts of the middle Vale it grows, but certainly inferior in quality. The price is seldom less than 2s. per gallon, from the mill.

The Huffcap and Sack are nearly allied in their qualities, and afford a perry of fine flavour and great strength: with these also may be ranked the Marsh-pear.

The Oldfield-pear is a native of Herefordshire, but now grown with great success and abundance on all the strong lands of this county. The liquor is little inferior to Squash, and always bears a high price: it is full of fixed air, very lively, and affords a delicious beverage for summer. This pear possesses the valuable property of keeping for a considerable time after it has been gathered, which is not the case with any other pears usually ground for perry.

The Red-pear, and Hartpury-green, produce a liquor, which, when properly fermented, is so highly spirituous as to be in some degree inflammable.

The Bareland-pear is a native of Herefordshire, and found in the greatest perfection there, and the adjoining county of Worcester. The soil of this county, however, suits it very well, and it is raised on almost every farm. The liquor has great strength, and a peculiar flavour, grateful to the palate, but less lively than the Squash or Oldfield. It is highly esteemed for its medicinal qualities, in cases of gravel.

The Black-winter is much planted below Gloucester, produces a strong perry, but is not much esteemed for flavour.

The abovementioned sorts are the principal for grinding, though there are many more of inferior quality, generally mixed with Wilding apples to correct their austerity, and serve for present family use.

It is a subject of controversy, whether orchard planting be, on an average of years, advantageous either to landlord or tenant.

The expences of planting twenty acres may be thus estimated. At the distance of sixteen yards asunder, an acre will admit sixteen stocks, which, including the original cost, cannot be planted and fenced for less than 5*s.* each, making the total 4*l.*:—2*s.* 6*d.* per head must be allowed for grafting, protecting, and repairing the fences, till the trees are secure from danger. For the first twenty years the return will be small; and certainly in not less than thirty years will the landlord be able to put an additional rent on his lands on account of the plantation. To these expenditures is to be added the cost of erecting a cyder-house and mill, which cannot be stated lower than 80*l*. The estimate will then stand as follows:

		£.	s.	d.
Planting 20 acres - - -		80	0	0
Grafting, repairing, &c. - -		40	0	0
Interest for 30 years on 80*l*. - -		120	0	0
Building cyder-house, &c. - -		80	0	0
Total expence - - -		320	0	0
Interest of 320*l*. -	£.16 0 0			
Profit - - -	14 0 0			
		30	0	0
Advance of rent on 20 acres -		30	0	0

Hence it appears that the land-holder has the distant prospect of increasing his income 14*l*. per annum, or of receiving nearly 10 per cent. for money laid out, subject, however, to deductions for repairs, &c.

With the tenant, the advantages are less certain. Suppose the orchard so well planted and grown, as to contain sixteen trees capable of producing, in a good year, sixteen barrels, or 800 gallons of cyder, which is a large average allowance; suppose that the cyder be sold from the mill at 4*d*. per gallon, the produce will be 13*l*. 6*s*. 8*d*. per acre, subject to the deductions of 20*s*. for tythes, 2*l*. for making, 10*s*. for gathering; in the whole, 3*l*. 10*s*.: the remainder, 9*l*. 16*s*. 8*d*. will be clear profit; and did this occur every year, it might be considered as highly advantageous; but a good crop seldom happens oftener than once in four years, though the damage done to the grass under the trees is continued, as well as the increased parochial rates from the increased rent; it does not therefore appear, that the additional rent on account of the trees is returned with much interest.

Where, however, the management of these liquors is well understood, and attended to, and where there is a capital sufficient to prevent the necessity of immediate sale, and casks enough in the farmer's own cellar, he is enabled to bring it to market, on the first favourable occasion, after the quantity of stock throughout the country has been reduced by early sales, and no fresh supply expected from the crops of succeeding years: under these circumstances, the price is often advanced to 8*d.* or 1*s.* per gallon. Old cyder is at all times a valuable article, and pays for keeping. This, therefore, is the best chance of countervailing the uncertainty of the crops, though it more often profits the dealer than the grower.

Farmers who live near to canals, or navigable rivers, have, as was before intimated, advantages peculiar to their situation. They turn long keeping fruits, such as Morland-pippin, Longney-russet, Lemon-roy, &c. to a better account than grinding into cyder, by sending them into the interior of the island for table use, at the price of 16*s.* per seam: for, supposing that eleven seams, of nine pecks each, are required for 100 gallons, the cyder should be sold for 8*l.* 16*s.* to equalize the profit of their sale unground; but cyder, in its early state, seldom averages more than 9*d.* per gallon, which would be only 3*l.* 15*s.*; so that, even supposing all the cyder to turn out well, the former method is far the more advantageous; and in this way only can the profits of a fruit estate be satisfactorily made out in favour of the tenant.

CHAPTER X.

WOODS AND PLANTATIONS.

On the Cotswolds, beech and ash are the principal trees of the woods: beech, indeed, seems the natural growth of the soil, and probably, at a remote period, covered the greater part of this portion of the county. The principal woods now remaining in the interior of this district, are those of the late Lord Chedworth, at Compton and Stowel; of Lord Bathurst, at Cirencester; and of the Bishop of Durham, at Rendcomb: but the declivities of the hills which border the Cotswolds towards the Vale, almost along the whole extent, and particularly from Birdlip to Wotton-under-edge, are covered with the most luxuriant beeches, which present to the Vale a continued verdant skreen. The most extensive are those of Sir William Hicks, at Witcomb; Mr. Sheppard, at Hampton and Avening; Mr. Kingscote, at Kingscote; but above all, in extent as in beauty, the magnificent woods at Spring Park, and on the Frocester and Stanley hills, belonging to Lord Ducie.

As these beech-woods re-produce themselves from seeds self-sown, they generally come up so thick as to require to be constantly drawn for the first twenty or thirty years. The remaining trees then stand for timber, and are supposed to come to their perfection in seventy or eighty years. Woods of the best timber will then be worth from 80*l.* to 100*l.* per acre. They are sold to dealers, who convert the timber on the spot, into proper scantling for gun-stocks, saddle-trees, bedsteads, chairs, and other cabinet work; and of late years a considerable portion has been converted into what is called, in the West Indies, lumber, or staves for sugar-hogsheads. These several articles, deprived of waste bulk, are carried on at a cheap rate to Birmingham and Bristol, for exportation; but the cost of carriage prevents the supply of them to a London market.

The waste and ordinary trees are either burnt into charcoal, or sold as billet-wood to the bakers, from 12*s.* to 15*s.* and in some situations even 17*s.* per cord of eight feet eight inches long, four feet four inches high, and two feet two inches wide. At this price per cord, the timber brings from 5*d.* to 7*d.* per foot; whilst the good trees, sold separate, are worth from 10*d.* to 1*s.* per foot.

In the Vale, there are but few tracts of woodland left: the principal belong to Lord Berkeley, near Berkeley; Lord Liverpool, at Hawkesbury; and Lord Ducie, at Tortworth. In the park of the latter, as in the adjoining chace of Micklewood, there are remains of the Spanish chesnut, so considerable as to authorize a conjecture that, in times not very remote, this formed a considerable portion of the timber of this part of the county: but above all, as a testimony of this fact, must not be unnoticed, the venerable chesnut tree growing in the garden at Tortworth-house, mentioned by Evelyn, in his Sylva, as being known to be 500 years old in the reign of King John. The tree, even now, makes a good appearance in branches and foliage, is in high proof, and, in 1804, bore a considerable quantity of fruit. It was measured in 1791, and found to be forty-four feet and four inches in circumference.*

The elm-tree grows almost in every district, and is reproduced in great abundance from the old roots: it is the general practice to trim them up, leaving a very few branches at the top; but in the lower part of the Vale, particularly in the vicinity of Bristol, are abundance of fine elms, left to their natural growth, which form timber of large dimensions, and excellent quality.

The oak grows with much vigour in several parts of the Vale, particularly within the hundred of Berkeley. In the hedges of the inclosures, they are usually pollarded and lopped; but in the woods are left more to themselves, and of consequence grow to a larger size, and produce sounder trunks.

The Tortworth chesnut is not more remarkable, than was the great oak at Boddington, before, by accident or design, it was burnt down, 1790. This oak grew in the old orchard ground belonging to Boddington Manor farm, and the following account was given of it by Mr. Marshall, in his Essay on Planting, as it appeared in 1783. "The stem is remarkably collected and snug at the root; the sides of its trunk being more upright than those of large trees in general; its circumference at the ground, somewhat more than eighteen yards, and at its smallest dimensions twelve. The greatest extent of arm, eight yards from the stem; and the greatest height of the branches, forty-five feet. The stem quite hollow, forming a capacious well-sized room, measuring on the floor, one way, more than sixteen feet in diameter. At that time perfectly alive and fruitful, with a fine crop of acorns upon it." Part of the trunk escaped the fire, and still remains.

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* The *fagus castanea*, or what is generally called the Spanish chesnut, was probably much more common in England formerly, than it is now. The old houses of London, as also of Gloucester, were generally built with the timber of this tree. In the Forest of Dean is a portion of considerable extent, still called Chesnut's-hill; it is not far from Flaxley, and might have been the very spot where, according to Ducarel, Henry II. granted the tythe of this fruit to that Abbey. There seems to be little reason to doubt of its being a native of this island.

In the Forest of Dean, notwithstanding the continual depredations committed, there still remains a large quantity of valuable timber. Under the direction of Government, the number of trees has at different times been well ascertained. In the reign of Charles I. there were growing within the limits of the Forest 105,557 trees, containing 61,928 tons of timber, 153,209 cords of wood. This number had been considerably diminished during that reign, by an imprudent grant made to Sir John Wintour, as appears by the survey of the following reign, when there were found 25,929 oaks, and 4204 beeches, containing, besides cordwood, 11,335 tons of ship-timber. The grant was renewed; and so much diligence was employed in the destruction of the trees, that, in 1667, of 30,133 oaks and beech mentioned in the preceding survey, only 200 remained; and, of the 11,335 tons of ship-timber reserved, not more than 1100 had been delivered. In the 20th Charles II. 11,000 acres were enclosed, planted, and carefully protected; and on these, the principal timber for the supply of the King's dock-yards immediately from this Forest, has of late been felled. In 1714, there were computed to be 27,302 loads fit for the navy, and 168,051 trees, of about sixty years growth. In 1783, on a new survey it was computed, that there were 90,382 oak trees, containing 95,043 loads; and in 1788, the timber growing in the Forest, and immediately belonging to the Crown, was as follows: 24,000 oak trees, measuring about 30,000 loads; and 22,000, about 11,000; besides unsound trees, which were numerous, and a considerable quantity of fine large beech, and young growing trees, sufficient to furnish an annual supply of 1500 loads for seventy years from that time, which, by proper management, and well protected inclosures, might be made perpetual.

Besides the oak timber growing on the royal demesne lands, there is a considerable quantity on the estates of individuals, which are held under the Crown, within the district, in purlieus of the Forest, as well as of other landowners in the parishes of Dimock and Longhope, adjacent to the Forest, and within what is agriculturally considered as the Forest district.

The birch trees of the Forest *(betula alba)* merit particular mention, as in no place are they found more remarkable for size or beauty.

The holly likewise *(ilex aquifolium)* grows here to a large size, and clean in its wood. It is much valued for inlaying cabinet work, and turner's uses.

Plantations. If, under this, we include grounds immediately attached to the seats of noblemen and gentlemen resident in the county, numerous are the planters, who have skreened the bleak spots of the Cotswolds, and have improved and adorned the general face of the county. But considering this part of the enquiry in an agricultural view, there are no instances in the county of considerable tracts of waste (the Forest excepted) being planted with the prospect of a future return in timber, whilst in every year many acres of beech woods are destroyed, and given up to the plough.

In the Forest of Dean, nevertheless, within the last thirty-five years, nearly 3000 acres have been planted, chiefly with oak.

The usual time of planting acorns in the Forest, is as soon after Christmas as the weather will permit. This practice is founded on the idea, that they are likely to be eaten by mice and other vermin, if planted before; but an intelligent planter belonging to the Forest is of opinion, that autumn planting is best, because at that time there is sufficient food for these animals, and more easily obtained; and that in spring, after the acorns have lain in the ground for the winter, they become sour and unpalatable.

The method of planting is, first, to mark out the ground; then taking off about a foot square of turf, to set two or three acorns with a setting-pin; afterwards to invert the turf upon them, and, by way of raising a fence against hares and rabbits, to plant two or three strong whitethorn sets round. They are seldom thinned till they have attained the size of hop-poles, and then are left at twelve feet distance from each other, with the view of again thinning them, by taking out every other one, when they are thirty years old, and have attained the size of five or six inches diameter. By growing thick, no side-shoots are thrown out, which supersedes the necessity of pruning.

The young trees which are drawn at the first thinning, are transplanted, and, as it is thought, grow equally well with those that have not been removed, and produce timber as full at the heart, compact, strong, and durable, as that which is raised immediately from the acorn.

An elevated common, called Woolridge, in the parish of Maisemore, was planted about the year 1735, by

Bishop Benson, with 1200 small oaks, collected from the neighbouring coppices. On the inclosure of the common, in 1793, the greater part were cut down: they had taken their growth with different degrees of vigour, but in general measured from five to six feet round, near the ground. Of those which were left, one was cut down this year (1805), which measured nearly eight feet round, and in length about fourteen feet: the timber is perfectly solid, without a blemish or decayed part in it.

Among trees which bespeak the attention of the agricultural planter, both for its timber and fruit, is the walnut *(juglans regia)*. It will grow almost in any soil, wants no pruning or care, and, in less time than the oak, will make a large tree. The wood is too valuable to apply to the usual purposes of timber trees, but is always used either in cabinet work or for gun-stocks: for the latter, indeed, so great has been the demand for a few years past, from the Birmingham gun-makers, that the county has been ransacked for this wood, and high prices have been held out to tempt the sale of it. In consequence of this, the stock has been much diminished, and, with very few exceptions, only here and there is a solitary walnut-tree seen growing. In the parish of Arlingham there are more, perhaps, than in many other parishes combined; so abundant, indeed, is the fruit this year, (1805,) that it is become an article of commerce, and two vessels are now (October 11) being laden with walnuts for Scotland, at Arlingham, as low as 4*s*. or 5*s*. a thousand. Even at this price, the produce of a tree is highly valuable, as 20,000 are not considered an extravagant calculation for a large tree.

The price of good walnut-tree is from 2*s*. 9*d*. to 3*s*. per solid foot.

Of coppice woods, there is no considerable quantity within the county; what there is, is chiefly within the Cotswold and Forest district.

The management of them on the Cotswolds, may be learnt from the following method pursued by J. Raymond Barker, Esq. of Fairford.

The coppices are intersected by small cuts of six feet wide, and these divided into fourteen equal parts: one part is cut annually, so that the cuttings come regularly round in fourteen years growth. Wherever the ash roots are found to be dead at the time of cutting, and the wood becomes thin, it is planted the following year with young ash plants about an inch in diameter, cut down to the height of two feet, which is sufficiently high to preserve the young shoots from hares and rabbits. It is proved by experience, that ash is preferable for coppice to any underwood, except the black sallow *(salix cuprea)* in moist places. As timber trees, by the spreading of their branches, necessarily injure the underwood, all the large branches are cut off at about eighteen inches from the body of the tree, which, from the experience of more than twelve years, has been found not at all to check the growth or hurt the timber: from this management the tree every fourteen years yields a considerable quantity of faggots, and the underwood flourishes near it.

In some coppices, the small stuff, called drift-wood, is sold, if good, as high as 5*s.* the square perch. This is used for hedging; the poles are made into hurdles, which on the spot are worth 16*s.* per dozen.

In the Forest district, the coppices are also divided into portions, and cut every fourteenth or fifteenth year. The oak is found to have a quick growth for this purpose: being cut down near to the ground, it shoots up with several branches, and on stiff lands is most useful for coppices. Ash, however, forms a considerable part, grows freely, and is useful for various purposes, such as making hoops, hurdles, hop-poles, &c. The oak, if of sufficient size, is split into laths, or sold for the use of the coal-pits, and a great deal of both is made into cord-wood, for the consumption of the iron furnaces, either in its natural state, or converted into charcoal.

Birch, witch-elm, sycamore, lime, and others, are found in the coppices. The latter, provincially the "whitten or whitrod," *(tilia cordata,*)* though not recommended as the most profitable, is remarkable for its uses. Of the inner bark are made ropes for cyder-presses, draw-wells, and fishing-boats. To the latter purposes, they are excellently adapted, as not contracting or expanding from moisture or drought. The bark is stripped off about Midsummer, dried like hay in the sun, and is called "bast:" it is either manufactured on the spot, or removed to other places for the same purpose. Bast-ropes are sold at a hundred yards length, in pairs, for 14*s.* per pair.

The wood of the tree is remarkably white, and is sold to the toy-manufacturers in Bristol for 30*s.* per ton. The price of coppices here varies from 2*s.* to 4*s.* the square perch, or from 15*l.* to 30*l.* per acre.

Various kinds of trees are planted about the farms, which, though not adapted for timber, are useful and profitable in many ways.

The white willow, "withy" *(salix alba),* may be applied to so many purposes, bears lopping so well, and grows so rapidly, that few farms in the Vale are, and none ought to be, without it. Sets of seven or eight feet long, cut from large trees, and sold for 4*s.* per dozen, are planted in the spring, and, if the soil be moist, certainly strike, and soon make trees of considerable size. If left to grow, they rise to a great height; but as they are raised for the advantage of the lop, the heads are cut down, or pollarded, to the height of ten feet. In this way they afford a succession of poles, every six or seven years, which are made into hurdles, cow-cribs, stakes for fences, &c. The trunk, when arrived at a proper size, being white and light, is used in making milk-pails, and other utensils for the dairy.

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* This is the second variety of the *tilia Linnæi,* and is thus described by Withering: "Var. 2. Leaves unequally serrated; fruit cottony, cells 5. *Tilia cordata,* small leaved lime or linden tree. *Ray.*"

The osier, "sallow," or willow *(salix viminalis)*, is planted in beds, on the banks of the Severn, and other streams, as well as some boggy patches, unfit for cultivation. Short sets are put in the ground in October or November, so as to leave two or three buds unburied; from which, shoots are thrown out the next spring, and fit for cutting the following year. If for common basket-work, the cutting is about Christmas; if for white work, as soon as the rind will separate. The plantation is usually sold by the piece, or number of bundles, and then cut and tied up by the seller. A bundle measures a yard and more than a quarter round, at the lower end, and is sold for 1*s.* unstripped of the bark, or for 5*s.* when stripped. Two hundred and forty bundles are cut from an acre; raised with little expence, and no trouble of cultivation, except occasionally cutting the sedge-grass that grows among them.

The alder-tree *(betula alnus)* grows freely in boggy places, but principally on the banks of the numerous rivulets which intersect the Cotswolds, and other parts of the county. It is used for making patten-woods, heads of brushes, and other articles of that trade; and, having the property of lasting a great while, when kept constantly under water, is applicable to some purposes in water-mills, piles, &c.

The maple *(acer campestre)* is found in considerable plenty, but having few useful properties, except for the turner, is not much encouraged.

The common horse-chesnut *(esculus hippo-castanum)* is an ornamental tree in plantations, and affords a good shade for cattle: in other respects, it is of little use on the farm; and though it has been suggested, that the nuts are capable of being converted into starch, yet no experiments of the kind have been made in this county.

Poplars of all kinds are found scattered in different parts; and the wood of the white poplar, *(populus alba,)* and the aspen, *(populus tremula,)* make neat but soft flooring, and is applied by cabinet-makers to inlaying furniture.

The Lombardy poplar has of late years been much planted for ornament, but is not generally considered of great value; the wood is incapable of resisting the weather for any exposed purposes, though it is said to make useful and lasting scantlings for rafters, &c. where the situation is dry, and well protected from rain.

CHAPTER XI.

WASTES.

About 10,000 acres now remain in a state of waste in this county; a small part of which is in sheep-downs on the Cotswolds.

The common or waste lands in the Vale, are seldom stinted to a definite quantity of stock, in proportion to the number of acres occupied; but the cottager claims by custom to stock equally with the largest land-holder. It is justly questioned, whether any profit accrues to either from the depasturing of sheep, since the waste commons, being under no agricultural management, are usually poisoned by stagnated water, which corrupts or renders unwholesome the herbage, producing rot, and other diseases, in the miserable animals that are turned adrift to seek their food there.

The supposed advantages derived by cottagers, in having food for a few sheep and geese on a neighbouring common, have usually been brought forward as objections to the inclosing system. This question was much agitated with regard to the inclosure of Corse Chace, in this county; but if the present state and appearance of it, since the inclosure in 1796, be contrasted to what it was before, or its present produce of corn to the sheep that used to run over it, little doubt can remain of the advantageous result in favour of the community: 1350 acres of wet and rushy waste were inclosed, and, in the first year of cultivation, the produce was calculated at 20,250 bushels of wheat, or some other crop in equal proportion. If it could even be proved, that some cottagers were deprived of a few trifling advantages, yet the small losses of individuals ought not to stand in the way of certain improvements on a large scale. Besides, the augmentation in demand for the cottager's labour, will much overpay his loss by this trifling privation.

Common wastes, which have been long depastured with sheep, are capable of being converted to tillage, or even kept in pasture, with great advantage.

In 1800, a piece of land was inclosed by a cottager on a common, in the middle part of the Vale; the soil a deep retentive clay. It was dug and planted with potatoes, that and the following year, and bore great crops. In 1803, and 1804, it was ploughed and dibbled with wheat, and produced in both years crops equal, if not superior, in ear and stalk, to the best cultivated old land in the parish.

In other instances, where portions of common waste have been taken in, a similar success has been the result.

Some waste lands which are now employed as warrens for rabbits, may not perhaps be capable of being converted to tillage with any great prospect of advantage, at least without extraordinary expences; yet, speaking of the county in a general view, there are few acres that may not by cultivation, and draining, be made productive of corn. See chap. 13. sect. 5.

The inclosure and cultivation of the Forest of Dean, have been represented as likely to be highly advantageous to the Crown and nation; and, doubtless, every plan which proposes to increase the supply of provisions for an increasing population, deserves serious consideration. The conversion of 23,015 acres into tillage, may, on a fair calculation, be supposed to add to the common stock 230,150 bushels of wheat, or other species of food equal to it. This quantity would supply 28,768 persons with bread, at the rate of one quarter, Winchester measure, to each; or would produce, in money, 69,045*l.* allowing wheat at 6*s.* per bushel, annually.

This statement appears, at first sight, decidedly in favour of conversion to tillage; but it is also to be considered, how far the supply of timber afforded by the Forest can be given up with safety. The Forest furnishes about 1000 loads of navy timber annually, which probably falls short of the expectations generally entertained; but considering the necessity of keeping up a powerful navy establishment, the prudence of giving up even a single tree may be questioned, till an adequate supply be secured elsewhere.

Were the navy interests out of the question, a doubt could not be entertained about the present disadvantageous application of these lands, even in point of annual return in money, without any reference to the increase of provisions: 1500 loads (which is the highest calculation of supply) are worth, at 3*s.* 6*d.* per solid foot, or 7*l.* per load, 10,500*l.* or about a sixth part of the annual produce or value of corn in money, in a state of cultivation: and even from this, a considerable deduction is to be made for the loss of rent, and great expences.

In the conversion of waste lands to tillage, the process depends on the nature and depth of the soil. On the hills, the practice is to breast-plough, and burn; the ashes being scattered over the land, and ploughed in, supply the best artificial manure for these light soils.

Turnips grow extremely well on this dressing, and, being eaten off by folded sheep, leave the land in an excellent state for a repetition of the same crop, or wheat.

Other plans have been adopted for the same purpose, somewhat varying after the first crops, of which the following may be instanced. Mr. William Peacey, on a farm he occupied under Lord Sherborne, in the hamlet of Eastington, in the parish of Northleach, was by his lease restricted from breaking up and converting a certain portion thereof, called Eastington-downs, adjoining his Lordship's park. The herbage was a coarse sedge-grass, of very bad quality, intermixed with a dwarf prickly thistle, which, in the summer season, covered more than half the ground, and annoyed the sheep very much in grazing. It was obvious, that this land was capable of great improvement; and on application being made to Lord Sherborne, and the intended mode of management being explained, consent was obtained for the conversion of it.

The experiments were made on eight acres only, in the following order:

First year. The land was pared and burnt, and sowed with turnips; then fed off with folded sheep as usual.

Second year. Sowed with turnips again, and fed off. As soon as the crop was cleared, the land was worked with the scuffler and hoe, and, by repeated operations, laid level, so that no vestige remained of the plough. Having previously collected, with great care, the seeds of the best natural grasses from his own meadows, he mixed them with one bushel of his own (Peacey's) ray-grass, and one pound of white or Dutch clover; so that the quantity for an acre, including the ray-grass, clover, and natural seeds, was four bushels, which were sown on the 3d of September.

Third year. The whole was summer-grazed with sheep and beasts, and continued to be so, with the intermission of a fortnight only in the fourth season, for the purpose of skimming the bents.

Second experiment, on seven acres more.

First year. Pared, burnt, sown with turnips, and fed off, as before.

Second year. Sown with turnips, early in the season, and eaten off in October; then immediately ploughed, and sown with winter-tares.

Third year. The tares were eaten off in the summer with sheep, and again sown with turnips, which were eaten off, and the land ploughed immediately; then scuffled as before, and sown with seeds early in September.

Fourth year. Mowed in May, and the aftermath fed off with sheep and cattle.

Fifth year (1800.) Mowed in May as before.

Third experiment.

First year. Pared, burnt, sown with turnips, and fed off as before.

Second year. Sown with turnips, and fed off with sheep. The ground immediately ploughed, and worked very fine with scuffler and harrows; then rolled down, and sown with seeds about the latter end of May. In the beginning of September following, it was stocked with 300 sheep for feeding. They continued on the land two months; and then it lay untouched till the 19th of May 1800, when it was mowed, and, though so early in the season, was supposed to produce a ton and half per acre.

Mowing the first crop is preferred, because the high condition of the land from two years turnips, gives a very luxuriant growth to the stronger grasses, which require so great a weight of cattle to keep them down, that the more delicate ones are always injured, and sometimes destroyed; whereas, by early mowing, the more luxuriant sorts are cut down, and laid open to the influence of the sun and air: the finer ones, which have been protected by the shade of the other, then acquire strength to keep pace in their growth with the after-grass.

The allowance of seeds in the first experiment having turned out too much, half a bushel in the ray-grass, and as much in the collected seeds, were afterwards omitted, making the whole quantity three bushels.

These observations include generally the mode practised on the Cotswolds, for laying down as well as breaking up, and may be considered as supplementary to chap. 8. sect. 2.

In some parts of the Vale, the breast-plough has been used for breaking up of old commons: this is the case where they are covered with rushes or furze, but usually the lands are found already in a state of good pasture, and want only levelling and draining, if intended to remain in herbage. If intended for tillage, which is more common, it is either dug with the spade, and planted with potatoes, teasels, or flax, or turned over with the plough, and left to rot in that inverted state; then torn to pieces with heavy drags, and the roots and filth collected together and burnt; afterwards again ploughed, and sown broad-cast with wheat.

The former is the best practice, because it is attended with less trouble, and more certain of a crop. Potatoes, teasels, and flax, grow strongest in the turf of new broken land, and not well indeed in any other, unless plentifully manured; and there is not so much fear of injury to them from grubs and insects, which harbour in innumerable quantities in the turf, and often prove destructive to wheat, till, by cultivation, they have been dislodged, thrown to the surface, and destroyed by birds.

If wheat, however, be intended for the first principal crop, the land is sometimes pared and burnt immediately after mowing, and ploughed up as soon as possible, and sown with turnips. The thick matted roots of grass afford excellent ashes, and a great crop of turnips is the sure consequence, if the season be suitable. These are eaten off about November, and, on the land once ploughed, wheat is sown.

Many land-owners are averse to paring and burning on the Vale lands, as tending to impoverish, which probably is the case, if the plough goes deep; for soil burnt to a state of brick, seems to have lost all powers of vegetation; at least it has not yet been proved otherwise by actual experiment; and this being the case, the land suffers a diminution of staple, and consequent loss of those parts which have been brought into action by long exposure to atmospheric influence and manure. Light paring, however, will probably answer best, as being the only way of destroying the insects, which, more or less, injure all crops, except potatoes, flax, and teasels.

A good method is, after the crop of grass is off, to pare light, and burn; then spread the ashes and turn them in with a shallow furrow; after this, to "thwart" or cross plough the land; then plough again the right way, and put it in a good form; and in November set the wheat by hand. This is the practice of a good farmer in the neighbourhood of Gloucester, and has been attended with great success. A second crop of wheat may be taken, with a certainty of succeeding.

The sod of the old Vale grass grounds is, as was before observed, so thickly matted, that it affords a great quantity of ashes; but it is also so deeply rooted in the soil, that the operations ought to follow each other with considerable rapidity, otherwise the grass will soon shoot out again, and form a new turf. At this time (Oct. 5, 1805,) a piece of ground in Sandhurst, which was pared and burnt in August, carries almost the same appearance of herbage, as if it had been left untouched.

CHAPTER XII.

IMPROVEMENTS.

SEC. I.—DRAINING.

THE great advantages of this operation in husbandry, are now in general pretty well understood, though not pursued so extensively as might be expected. Much has been done, and much still remains to do.

It is obvious, that different situations and soils require different methods. Some lands have so retentive a sub-soil, that underground draining is of no use; and a few "grips," or small channels, cut in different directions, offer the only method of carrying off the surface-water while it is continued in a pasture state: were it to be converted to tillage, the subsoil would be more divided, and give more opportunity for the operation of underground drains. These grips ought to be opened every year, which, done by hand, is expensive; the expence, however, in some parts of the county, is lessened by the use of a grip-plough.

On the lands adjoining the Severn, the influx of tide-water is prevented by flood-gates, placed in the large reens or ditches, so contrived that the gate is closed by the weight of water as it rushes from the Severn, and the progress checked; but on the subsiding of the tide, the gate is again set at liberty, to let out the water which has been collecting on the upper side from the streams. With all these precautions, however, great inundations are often experienced, and attended with considerable damage. Of late years, much has been prevented by the Commissioners of the Sewers, who have the regulation of the banks, or sea-walls, flood-gates, &c. The parishes, within the jurisdiction of this commission, are rated to the general repairs, in proportion to the number of acres in each, exposed to inundation. Between Arlingham and the lower extremity of the county, at the efflux of the Avon into the Severn, 12,130¾ acres are under this management, and may truly be said to be kept in a state of utility by the attention of the Commissioners. See chap. 12. sec. 5.

Underground draining is performed in different ways, according to the nature of the soil. Where it is stoney, the drains are made with pick-axes, and other strong instruments, to a proper depth; rubble-stones are then thrown in, and covered, at about ten inches deep, with peas-haulm, or any material of that kind, to prevent the surface-mould from filling up the interstices of the stone substratum. This is the method of covering on tillage lands; but on pasture, the turf reversed, and laid on the stone, answers the purpose as well, or nearly so.

In the Vale, where rubble-stones are scarce, and on the clays, drains are dug with proper spades and scoops, to the depth of from eighteen inches to three feet, or more, as circumstances require; about a foot wide at top, and diminishing to a few inches at bottom: thorns, or brush-wood, are then laid neatly in the narrowest part, and covered with turf, and the remainder filled up with mould; or, if thorns are scarce, the lower channel is left open, and on a shouldered part, at four or six inches from the bottom, inverted sod is laid, and covered with mould. This method answers well as long as the work lasts, but the channels are liable to be choked in time, from the pressure of the superincumbent soil, the burrowing of moles, the natural extension of roots, and other causes. The usual price is 6*d.* per perch, or "lug," for turf-draining, and 1*s.* for stone-draining.

Much has been done with a patent machine of Mr. R. Lumbert, of Wick Risington, which is certainly well adapted to strong cohesive soils, and considerably saving of expence.

The following reasons, for the preference to be given to this machine, are set forth by Mr. Lumbert himself.

First. Effective drains are made at 1½*d.* per lug, instead of 6*d.* in the usual ways.

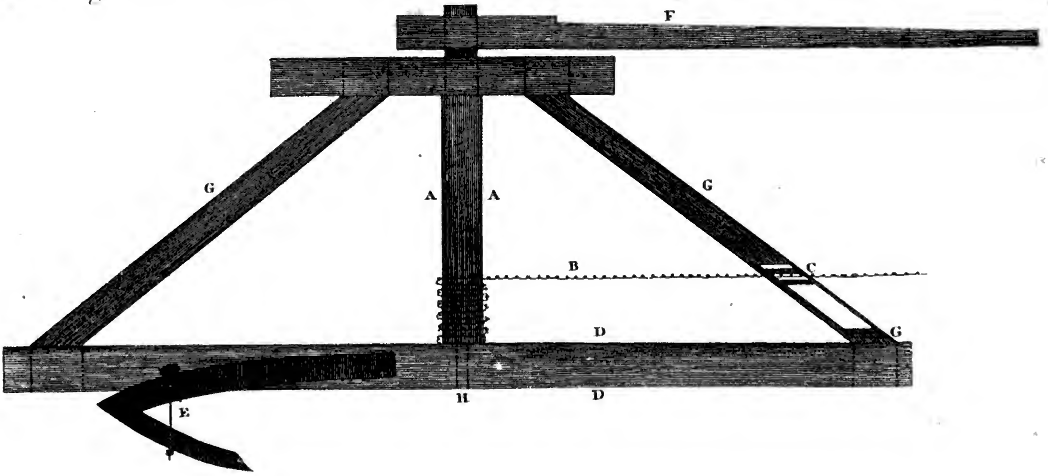
Secondly. The surface over the drains is left uninjured, instead of the much injured state in which it is commonly left.

Thirdly. No open carriers, or ditches, are left, which destroy a considerable portion of surface.

Explanation. The subsoil in which the drain is to be made, at from seventeen to twenty inches below the surface, should be clay or stiff loam: in this case, it is of no consequence, whether the wetness proceeds from surface-water or springs; but more drains will generally be required to draw off the former than the latter.

Land wetted by surface-water, will in most instances require 100 perches (six yards to the perch) of draining to every acre, to do the business well. The expence, by the old method of draining, even on a small scale, is so great, that scarcely one-third of the necessary drains are cut, and therefore often appears to do but little

Rogers's improved apparatus to the draining Machine.



good; and hence it is sometimes concluded, that clay is of too close a texture to admit of effectual draining. The experience of the draining-machine contradicts this opinion, where the drains are sufficiently abundant.

For some years, Mr. Lumbert found it necessary to cut open carriers, or ditches, across large pieces of flat land, to carry off the water issuing from the drains; this is now avoided, by making a covered carrier, or master-drain, of clay, formed by manual labour, which is better connected with the drain made by the machine, than a turf or stone drain, and more permanent, as well as more saving, of surface than an open carrier can be.

The machine is worked by eight men, who are enabled by the mechanical apparatus to do as much as thirty horses could without it, moving nearly six yards in a minute.

In Haresfield, some draining was done by this machine five or six years ago; and on some occasion, it being necessary to open the ground in a cross direction to them in 1805, the orifices were found perfectly open, and as clear from obstructions as when they were first made.

The plough is used frequently without aid of mechanical powers, and is drawn with ease by twelve strong horses: in this case, however, it is required that the surface should be tolerably dry and firm.

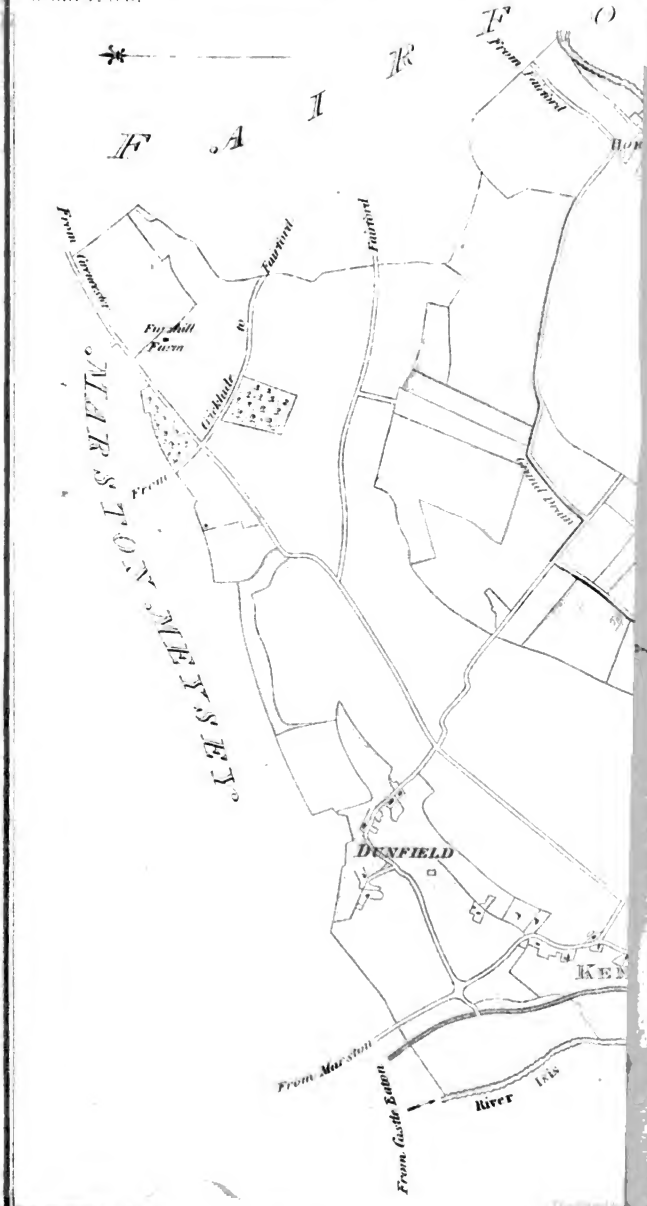
Mr. Rogers, of Withington, has improved much on the mode of working the machine, which, in its original state, was allowed to possess considerable unwieldiness. In the improved mode, the plough is moved forward by the revolution of a long lever and axle, by which one horse gains a power equal to thirty. *(See the annexed plate.)*

A long shaft, or lever, F. fastened on the square top of the upright axle, A. in the centre of the frame, is moved round by a single horse. To the axle is attached a strong chain, B. which winds up as the horse moves and draws the plough forwards. The horse steps over the chain every time he comes round, with ease, as forty yards of chain may be wound round the axle, without being raised fifteen inches from the ground. The chain is kept from springing up, by passing between two friction pullies, C, C. to the fore part of the plough. The apparatus, or frame, is made steady by an anchor of wood, E. which answers the purpose, though one of iron would be better. H. is an iron pin, or pivot, passing through the centre of the cross-bar of the frame, D. next the ground. G. G. are side pieces framed into the upper and lower horizontal timbers, to strengthen the whole. The frame is oblong, and one side only is here represented.

In this machine, three desiderata are combined—great power on simple principles, facility in the operation, and cheapness. An axle, lever, and chain, form the machine; one horse, with a man and girl or boy, can manage it with ease; the motion of the plough is steady, and brought forward without girds or jerks. Exclusive of the chain, the expence does not exceed two guineas, and is equal to under-draining pasture land, with sufficient profit to the owner, for one farthing per perch. Mr. Rogers has drained 400 perch in one day, to the depth of twenty inches, on his own estate.

In the Vale, draining is usually the work of Spring; though it is advisable to seize the opportunity, whenever the grass is short and the land in a firm but mellow state, yielding easily to the instrument, but not liable to be

to face P. 268.


FAIRFO
From Fairford
Hor
From Cirencester
Fairford
Fairford
Furzhill Farm
to
Cricklade
From
MARSTON MEYSEY
Grand Drain
DUNFIELD
KEN
From Marston
From Castle Eaton
River Isis

trodden in by the horse or horses, where the machine is used. Autumn is probably the best season, because the openings will be more likely to close by the moisture of the succeeding winter, than when immediately exposed to the drying winds and heat of Summer. Before the mole, or draining-plough, is used, it is a good practice to turn off the sward with the common plough; then to make the incision for the drain in the centre of this; the sward being afterwards turned back to its place, completely covers the aperture, and protects it from the effect of a subsequent dry season.

The long continued drought of the present Summer (1806) has opened many drains which were cut by Lumbert's plough, so much that the bottom is clearly seen, while many that have been done by hand have formed still wider chasms, and will probably not answer the purpose intended at all. In both instances there is reason to think, that this would not have happened if the operation had been performed in Autumn, and the surface turf first turned as last recommended.

The most curious and scientific mode of open drainage which has been effected in this county, is at Kempsford: it is new, and interesting, and reflects credit on the ingenuity of Mr. Edward Webb, of Stow, under whose direction the plan was carried into execution.

Where there is a large body of water to carry off by the general drainage, Mr. Webb has taken the upper drains, which collect the principal part of the water, two or three feet above the lower level of the lands, for the purpose of driving a wheel, by which the water is raised from the lower parts. On this principal drain, two wheels are fixed on one shaft; the broad wheel six feet wide, and eight high, driven by the fall out of the upper drain: the narrow wheel one foot wide and fourteen feet high, by which the water is raised three feet out of the lower drain to run off.

Explanation of the plate annexed. The grand drain is twelve feet wide at the bottom of the lower extremity, and diminishes in its progress upwards: at some places, it is nine feet deep below the surface.

The embankment of the embanked drain, is four feet high on the lowest land, and diminishes to a point at the upper part.

The lower meadows are embanked, to keep off smaller floods. The draining-wheel, B. drains the water off three meadows, three feet below their surface, by trunks through the embankments, and takes off all the upper waters; this wheel is driven by water from the upper drain.

One thousand acres are drained by the grand drain, and three hundred by the embanked drain. The land which requires this mechanical contrivance to get rid of its water, has of course no natural fall for common drainage, lying on the banks of the Thames, whose surface is generally above that of the adjoining meadows.

SECT. II.—PARING AND BURNING.

On the Cotswolds this practice is much followed, and is indeed almost essential to the very existence of the agriculture of this country. It is always a preparation previous to the conversion of downs; and, on saintfoin-leys, that are worn out, is the most advantageous and certain mode of restoring, and bringing back those lands into action.

The time of beginning this process, depends in a great measure on the nature of the soil. If it be clayey, rough, or sedgey, it should be done in December and January, that the frosts may dissolve and separate the mould from the roots; for where earth is left attached to the roots, it burns to a kind of brick, as before remarked, and at present is reckoned unfit for vegetation: the great end of burning on light soils, is to reduce the vegetable substances to ashes; and therefore care is required to get rid, as much as possible, of extraneous matter.

The sod having been thus pared, and exposed through the winter to the frost, the land is harrowed thoroughly, by which the earth is separated from the roots and fibres: then the whole is collected into heaps of about a bushel or more each, and burnt. In burning, much care and skill are required, for as the fertilizing powers of the ashes are supposed to depend on the quantity of alkaline salts retained, it is necessary to keep up a smothering fire, and prevent the bursting out of flames, which carry off the saline particles, by sublimation, into the atmosphere.

The depth to be taken off, depends upon the nature of the soil and intention of the process. Some soils will allow of going down three inches, others only of one; but the deeper the breast-plough can go the better, because a greater quantity of fibrous matter is turned up with the sod. The intention also varies; as, where two ploughings in the usual way would be injurious to the land, by lessening its tenacity, the weeds are destroyed, or their growth retarded, by barely cutting off a shallow surface with the breast or other paring-plough, which, even on wheat stubbles, is sometimes substituted for a first ploughing.

Though the good effects of paring and burning, be abundantly proved by experiment, yet on some estates the tenants are restrained by their leases from the practice. The reason of this restriction is founded on a just apprehension that the tenant will, if not restrained and watched, exhaust the lands, and render them foul, by repeated crops of corn sown broad-cast, without being hoed or manured, especially near the expiration of his lease. Instead of paring, therefore, the worn-out saintfoins are ploughed, and sown first with oats, then with turnips. The crops produced in this way, are much inferior, and the manure made from the straw, is not equal to the demands of the land.

In the Forest district, the practice has been partially introduced, on lands in a state of great foulness: the business is then performed in the Spring, or as soon as the weather will serve to dry and burn the weeds, and is usually the preparatory operation to turnips or wheat. Thus, whatever may be the real effect of the ashes on the following crop, the practice does not seem to be valued by the cultivators of this district, otherwise than as an easy method of cleaning the land. For manure, their chief dependence is upon lime, the beneficial effects of which have been proved by long experience, and few among them will take the chance of an accidental result.

In the Vale, the breast-plough begins to come into frequent use, but as yet is managed less scientifically than on the Cotswolds. Bean-stubbles are pared lightly in September, or as soon as the crop is off, and the parings are immediately raked together, and burnt; but in an open way and full blaze: at present, indeed, the Vale farmers seem to have little else in view, than to get rid of the weeds, and their seeds, which have collected on the surface: but with regard to the seeds, they must be disappointed, as, when drawn together with the rake or drag, the stalks only are collected, and the seeds are left behind.

The time, as was before observed, will depend on the nature of the soil, and much also on the intended crop. For turnips, the end of May or beginning of June will be proper; but if for earlier crops, as barley or oats, it cannot be done too soon after Christmas, when the weather will allow.

The breast-plough of this county is made somewhat in the form of a spade; the iron part, or plate, being from eight to ten inches long, and from ten to twelve broad, with a keen edge, turned up about an inch on one side, for the purpose of cutting the turf, and going off gradually, from about the middle, to a point. The handle of the shaft is held by the two hands against the thighs, and not against the breast, as in some places, and is pushed forwards by muscular exertion: the separated sod is turned over to the left, and laid with the surface to the ground. Two men working together, will pare an acre a day, or nearly, about an inch deep on stubbles. Price 8*s*.

SECT. III.—MANURING.

Dung from the farm-yard is the manure mostly used, where it can be had in sufficient abundance. At the beginning of winter, the yard, "fold," or "barton," is covered with straw, fern, furze, or whatever is most conveniently procured: this is occasionally renewed, and receives the excrements of the beasts confined therein, till the Spring, when they are turned out to grass. The straw, or other materials, having been trodden and impregnated through the Winter, is either immediately "hauled," or carted, to a proper place, and deposited in one large heap; or is collected into small heaps, where it goes through a stage of fermentation, previous to its being laid together in one "mixen." During the Summer, this fermentation is continued, till a complete putrefaction has taken place: the heap is sometimes turned, and better mixed with the spade, especially if, preparatory to it, a covering of soil has been put on, either collected from unemployed spots near hedges, or, what is more usual, from an adjoining waste. It is a common mode to plough up a part of the waste, where the dung-heap is intended to be made, and to lay the dung from the yard upon it: afterwards, when the "mixen" is turned, this bottom soil, which has received the deposit of salts during the process of fermentation, is blended with the whole. This is an excellent practice, since the juices will naturally sink from the top, and would be much wasted, if not lost, but for this bed of sod and earth, provided to receive them. Thus far the farmer goes on well; but here he too often stops, and leaves the dung-heap to be covered with nettles and other weeds, where they remain in a disgraceful manner undisturbed, till they have shed their seed. Besides the diminution and unprofitable waste of the fertilizing principles in the manure, the mischief occasioned by the vast increase of weeds is incalculable; the effects, indeed, are soon discovered on the lands which receive this foul dressing.

Under the best management, the manure of the farm-yard is subject to the inconvenience of increasing the stock of weeds: many sorts, such as melilot, charlock, and others, are carried into the barn, threshed with the corn, and lodged in the straw, with which it is mixed in the yard, and removed from the dung-heap into the field. This evil, which is scarcely avoidable, is made worse by the incautious practice of sweeping the refuse, after winnowing, into the yard, to be picked over by pigs and fowls, which are allowed to glean the corn unextricated from the straw. The good derived from the small quantity of food thus saved, is much overbalanced by the evil arising from the pernicious seeds, carried in abundance to the field, to the certain annoyance of the future crop: this refuse would be better burnt.

The yards in which the cattle are folded, are not, generally speaking, contrived with judgment, to secure the watery parts of the excrements from waste: a storm of rain will often carry off the most valuable portion into a neighbouring ditch, where it is lost to the farmer; and the remaining substance, which is left for use, is little better than broken straw.

Street-soil is a most valuable manure, and now as eagerly sought for agricultural purposes, as it was neglected a few years since. At Churcham, in the Forest district, were seen, in 1802, the different effects of farm-yard-dung and street-soil, on two pieces of wheat in the same field. The land belonged to the same farmer, and in the same state of cultivation. The manures were laid as usual on the fallow year, and the wheat on both pieces went on without apparent difference till the Spring, when that which had been dressed with the street-soil, put on the most healthy appearance; and though the other was very promising, yet, from the superiority of colour and forwardness of growth, the distinction was visible at half a mile distance; and the same superiority was kept up, both in the size of stalk, and bulk of head, till the harvest.

Street-soil carries few weeds to the land, and on this account, is particularly useful to that which is under tillage. Pastures are also much benefited, especially if they are cold and sour, by the coal-ashes, which form a considerable part of this manure.

The scrapings of the turnpike-roads, where lime-stone has been used, are now in some estimation. These cannot fail to be of service on all soils, but perhaps more so on clays and sands than any others; on the former, they have the power of unloosing the texture; and to the latter give a firmness, tenacity, and coolness, much wanted. Where lime is to be had at a moderate price, they are mixed together, and, by frequent turning, completely incorporated. This is reckoned the best practice, and is justified by its success.

Lime is a favourite manure, where it is within a reasonable distance of the farm; this, however, is unfortunately not the case in many parts of the county. Generally through the Forest district, and in the lower Vale, near Bristol, Sodbury, Cromhall, Iron Acton, Tytherington, &c. it is good, plentiful, and cheap; and agriculture receives the advantages of it, to a great extent. In almost all parts of the county, lime might be made from the calcareous rock of the hills, and the blue-clay-stone of the Vale; but the scarcity and dear price of coal, are decisive obstacles to the practice.

Lime is applied differently in different places; generally, however, on tillage lands. In the lower part of the Vale, a quantity is deposited together in a long heap, and covered over pretty thick with road-scrapings, turf-parings from the commons, soil from ditches, &c.: in this state it is left to slake, and at a proper time the whole is regularly turned with the spade, and left to be digested together, before being laid on the land. See p. 149.

In the Forest district, the lime is either mixed with soil, or more frequently carried directly from the kiln to the fields; and, being there dropped in small heaps, is left to slake in the open air. When reduced to a pulverized state, it is thrown over the land, and immediately ploughed in; and upon this the seeds of the intended crop are sown.

Both these methods have the desired effect, on the lands where they are used. The allowance is about a hundred bushels, in both districts, to an acre.

Marl is found in various parts of the county, but, as a manure, is little used. On the Cotswolds, some experiments have been made on pasture lands, and the result has been favourable. Judgment, however, is required in the application of this substance, with regard to quantity. Mischief may be done by overcharging the land; and indeed this effect has often been produced, and brought the manure into disrepute through a neighbourhood. Mr. Peacey used marl on his grass or pasture lands, at Northleach, after the rate of seventy or eighty tons per acre, with great success, as is evident from the great superiority which the marled lands have retained ever since, over those which were left in their original state. Stone-brash soils, such as was this marled land, are much infested with mosses: these were entirely destroyed by the marl; and fine clovers, and herbage of the best and most luxuriant kind, were introduced in their stead. The lasting effects of this manure, are a strong recommendation to the use of it; a piece of pasture well dressed, will flourish on the strength of it for twenty or thirty years. It belongs to the chymist to investigate the principles on which marl fertilizes land; for the cultivator, it is enough to be assured of the fact from the testimony and experience of others, and to be able to ascertain the distinguishing characters of this earth, so as to be enabled to make the experiment himself, with the probability of success. The goodness of marl is proved by its boiling or effervescing with any acid, but particularly with oil of vitriol, mixed in equal proportion with water. The easiest method is to reduce the marl to powder, and then add the acid.

The dung of all kinds of birds is highly valuable; that of pigeons, in particular, is uncommonly forcing, and is applied in the Spring, in small quantities, as a top-dressing to wheat.

Soot is applied nearly in the same way, and with similar effect. It is sold in Gloucester at 6*d*. per bushel, and about 100 bushels are a waggon load.

Night-soil, or human excrement, though from a variety of experiments proved to be a highly fertilizing manure, is seldom, if ever, used in this county. Prejudice is in a great measure the cause of this neglect; so that the whole which is supplied by the City of Gloucester is thrown into the Severn.

Soaper's ashes are much esteemed as a dressing for cold wet lands; they have the power of destroying aquatic weeds, and improving the herbage with abundance of white clover. The price at Gloucester is 8*s*. for a waggon load.

The refuse, or dregs, of the fellmonger's pit, "pud-"ding," consisting of lime and mucilage of animal substance, when properly managed, has strong fertilizing powers. If laid on the land in the state it comes from the pits, it diffuses through the neighbourhood an almost intolerable stench; and the pasture land on which it is laid, retains the smell so strongly, that cattle will not feed upon the herbage for two or three seasons. It forms an excellent manure, if mixed up with earth, frequently turned, and left in the mixen for a twelvemonth. It is sold at 6s. the cart load; and about ten are sufficient for an acre.

SECT. IV.—WEEDING.

With every good farmer the practice of weeding is become general, and almost universally with the hoe. The different methods have been pointed out in chap. 7. This attention, however, is very much, if not exclusively, confined to tillage lands, while docks, nettles, hemlock, thistles, &c. are permitted to grow undisturbed on the pastures. It is supposed, that the scythe will be early enough to cut them off; the seeds, however, are generally ripened and dispersed before mowing time; and if not, they are carried with the hay to the stall, and mixed with the dung, or into the pasture for fodder during the winter; in either of which cases, they cannot fail of increasing greatly. Besides, the mere cutting off this kind of weeds, rather improves than diminishes their growth, by forcing them to throw out new shoots from the roots, and that in greater abundance than before. Thus, a thistle which rises at first with a single stem, if cut off above the surface of the ground, spreads with several lateral branches, and covers a larger space of ground. The most likely method of destroying them, is to draw them up by the roots, which *may* easily be done when the ground is moist, and *is* done by those farmers who are anxious for their credit, nice in their herbage, and proud of seeing their pastures rivalling the neatness of a lawn. The negligence, indeed, of a neighbour often operates as a discouragement, and it is an evil not easily to be prevented: it is, however, surprising in another instance, to observe an almost unanimous encouragement given to the multiplication of noxious weeds. In the highways, they are left to grow to maturity, and their seeds are dispersed in immense quantities all over the country, by the wind, or carried by birds. Under these circumstances, it is certainly of little use for one, or even all the occupiers, to clear their lands, while this plentiful source remains unmolested. One should suppose, that the evident mischief resulting from this neglect, would excite a general combination against these destructive enemies to the interests of agriculture: that, however, not being the case, might it not be convenient to incorporate with the duty of the surveyors of the highways, the business of cutting up, and otherwise destroying, such kind of weeds within their district?

Should the fact of the thousand fold increase of such self-sown seeds be doubted, let any one observe a patch on a common, from which the turf has been pared, how completely it will be covered with thistles in the following summer; and arable fields adjoining are not much better, where this negligence prevails.

Of the several species of thistles, the three following are most general. The spear-thistle *(carduus lanceolatus)*, curled thistle *(carduus crispus)*, and the way or cursed thistle *(seratula arvensis)*. The two first, are seldom found in pastures or fields, in abundance at least, but usually in hedges, and by road-sides; and, not being perennials, by a little attention and cutting them off before they seed, may be destroyed. The last is found in great plenty in all situations, and, being a perennial, cannot be conquered but by extirpation, or constant wounding of the root under the surface. The root runs deep into the earth, and, afterwards spreading underground, throws up new plants in various directions; whence it would seem, that merely cutting them off with the scythe, serves rather to force them to extend horizontally, above and below ground, though at the same time it prevents their increase by seed. Where, however, the farmer will do *no more*, this is better than doing *nothing*. See chap. 5.

The same observations are applicable to nettles in a great measure; their seeds, indeed, are not so easily dispersed to a great distance; but a high wind will carry them most certainly to the neighbouring inclosures; and being once suffered to establish themselves firmly, they increase wonderfully, both by root and seed. For a fuller account of pasture-weeds, see chap. 8. sec. 1.; and corn-weeds, chap. 7. page 160.

SECT. V.—WATERING.

The practice of watering, or irrigation, is chiefly pursued in those vallies of the Cotswolds which are intersected by rivulets, and particularly in the meadows adjoining the Coln, and the Churn. In the parish of South Cerney, which is watered by the latter, it is carried to greater perfection, than elsewhere. The practice first began here, and has received all its improvements under the care and direction of the Rev. Mr. Wright, who has communicated the results of his experiments to the public in a treatise on the subject. To the judicious observations which he has made, little can be added; and those who wish to see the whole management fully explained, will refer to the pamphlet itself. It will be sufficient here, to notice some of the principal parts of this valuable improvement in the agricultural system.

A level of the ground intended to be watered, is taken, to ascertain whether it lies low enough to admit the river to be dammed up above it: the water is then conveyed, by a deep wide ditch, to the highest parts, keeping the sides of the ditch about three inches above the surface of the meadow. For ten acres the ditch should be ten feet wide, and three deep at least; and if it can be carried as deep as the river, it will draw off more mud. From this, which is called the master feeder,* smaller trenches are cut at right angles, about twelve yards apart, two feet wide, and one deep. In each trench, as well as the master feeder, frequent stops or obstructions are placed, to keep the water high enough to flow through some notches cut in the sides, or even to run over them. The width of both is contracted gradually; as the quantity of water decreases the farther it runs. Stagnant water being esteemed prejudicial to the turf, and chilling to the land, between every two trenches a parallel drain is cut to a proper depth and width, to receive all the water that runs over the two adjoining beds, or plots of ground, and to carry it off into the the master drain with such currency as to keep the whole sheet of water in constant motion. The fall of the bed should be half an inch in a foot; for where the draught is quick, the herbage is always fine and sweet. The water should never flow more than two inches deep, nor less than one, except in the warm months.

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* Every feeder is cut with a certain degree of descent, which keeps the whole body of water in motion; whereas, in other counties, (as the art is taught by Mr. Boswell, Mr. Grinsell, and others,) the conducting ditch is cut upon a *dead level*, which must cause a considerable stagnation, the principal thing to be avoided in watering.

The grounds most easily and most effectually watered, are such as have been formerly in a state of tillage, and ridged up in lands twelve yards wide. The water is carried along the ridge by a small trench, and thrown over the sides by means of frequent stops, and from the furrows carried into the master drain, and thence into the river again. Flood-hatches on the usual principles, are necessary both at the point of influx and efflux.

When the first great rains in November bring the water down in a muddy state, it is let into the meadows. In December and January, the land is kept sheltered by the water from the severity of frosty nights; but every ten days, or thereabouts, the water is let entirely off, to give air, and prevent the roots from rotting. In February, great care is required. If the water now remains long on the meadows, a white scum will generate, which is found to be very injurious to the grass. On the other hand, if it be taken off, and the land exposed to a severe frosty night, without being previously dried for a whole day, much of the tender grass will be cut off. Towards the middle of this month less water is used than before, keeping the land rather *wet* than *watered*.

Advantages. At the beginning of March, there is generally in such meadows plenty of pasturage for all kinds of stock; the water, however, should be taken off nearly a week before cattle are turned on, and a little hay at night during the first week is very proper.

It is the practice with some to spring-feed with ewes and lambs folded, with a little hay. This certainly sweetens the future herbage; the meadows, however, must be entirely cleared of stock by the latter end of April. If May be at all intruded on, the hay crop will be much injured, and the grass become soft and woolly, like lattermath. After spring-feeding, the water is let in again for a few days.

It is remarked, that autumnal, winter, and spring watering will not occasion rot in sheep; but if the water be used for a few days in any of the summer months, the pasturage becomes unsafe for such stock. This is conformable to the general idea of rot, that it is occasioned by summer moisture, and is seldom known to any considerable extent without a long continuance of warmth and rain. A wet summer, therefore, is always productive of this disease in the Vale.

The general advantages are, that the land and herbage are continually improving, without manure; and the crop is not only *full* and *certain*, but also early.

Objections are made to the practice of watering, on account of the cutting of the land, and expences attending it: the loss or injury, however, sustained by cutting is trifling, as well as the expence, when compared with the profits.

Supposing a meadow of ten acres to be already in a level state, the expence of watering cannot exceed 60*l.* as the first cost. The master drain, if the meadow be square, will be about 220 yards long, the width ten feet, and the depth three: the cubical amount of which is 733 yards. The smaller trenches the same length, (which, however, is something more than the truth,) two feet wide, and one deep, and eighteen in number, amount to 3960 yards; the estimate of which will be as follows:

	£.	s.	d.
Digging 733 yards cubical, at 1*s.* per yard	36	13	0
Digging trenches, 3960 yards, at ½*d.* per yard	8	5	0
Hatches and other expences	10	0	0
	54	18	0

The loss of land will be about three quarters of an acre; but both these will be compensated by a crop of from two to three tons on an acre; and it is to be remembered, that after the first year the expences of clearing out the channels will be very trifling.

It is also said, that the hay is coarser than the upland hay; this, however, depends on the state of the crop. Hay of fine quality is made by early cutting, but the produce is less; if left to be overgrown, it becomes coarse, but the produce is greater; in the first instance more than two tons, in the last nearly three upon an acre.

In South Cerney, a meadow of four acres makes frequently a return of 30*l.* per annum, from hay and spring feed, exclusive of expences.

In Down Ampney, an active and intelligent farmer had a low meadow of fifty-five acres, which, in its original state, he reckoned dear to the occupier at 9*s.* per acre. After having levelled the uneven parts, and filled up the hollows, he formed the whole into a water-meadow, at the expence of 350*l.* which afterwards, without manure, produced an average crop of eighty tons of hay yearly.

It is obvious, that different situations require different management; but the general principles and practice being laid down, it will be easy to apply them; and the advantages are proved by experience to be so great, that no moderate labour or expence should deter the owner of land capable of irrigation, from adopting this mode of improvement. In many situations in the county, these advantages, however, are still neglected, while, in South Cerney, and the neighbourhood, every spring or rivulet, however insignificant, is made subservient to the purpose; and whenever a sudden rain occasions a temporary flood, the water is received in proper channels, and spread over the land: there is not, indeed, a stream or river on which a mill is or can be erected, which may not be made enriching to some quantity, if not to a large tract of land.

The advantages of irrigation are sometimes lost to the occupiers of land well situated for the purpose, by the want of proper precautions in the granting of mill-leases, without a reservation of a portion of the water, to be thrown over the adjoining meadows, belonging to the same proprietor. At Siddington, an occupier had two meads adjoining, of equal qualities, in their unimproved state, and capable of being watered by the same stream. He had the power of watering one, when, and as often as he pleased; the other only by permission, and when the miller pleased. The consequence of this restraint was visible in the crops: both were laid up at the same time, but the former produced much more spring food, a greater quantity of hay and lattermath, and of equal quality with the latter.

The good effects of irrigation on the lowlands near the Severn, Avon, Leden, and other rivers in the Vale, have been noticed, chap. 8. sect. 1. The great inconvenience of this natural watering is, that the floods usually lie too long and too deep on the lands, thereby producing a coldness in the soil, favouring the growth of aquatic plants: even with this disadvantage, however, a winter or spring flood gives life to vegetation, and insures an abundant crop, without other manure than the deposit of mud.

The overflowing of the Severn, over the lands from six to seven miles below Gloucester, is often attended with ruinous consequences. The surface of the river is in many places higher than the adjoining lands, when the tide is in, or the river swoln by land-floods; and the water is kept back by banks or sea-walls, constructed for the purpose, which, from want of repair or weight of water, are sometimes broken down, and many hundred acres suddenly inundated. From ten miles, or thereabouts, below Gloucester, the sea-walls are under the management of Commissioners, and inundations are not frequent.

The attention of the proprietors being directed to the single object of damming back the river, and not of admitting or letting it out at command, it is probable, that the injury sustained is greater than the benefit received, through the whole level. When, however, the tide-water overflows the lands, either meadow or in tillage, and quickly retires, the fertilizing powers are certain of being felt for many ensuing crops. That these effects might be secured by proper management, or *warping*, as on the banks of the Humber, on a large number of acres, particularly on the eastern bank of the Severn, cannot be doubted, if the Commissioners were to direct a part of their attention to this object.

CHAPTER XIII.

LIVE STOCK.

SECT. I.—CATTLE.

The dairy being the principal object with most of the Vale farmers, those cattle are usually kept which have the best bags, and most likely to give out the largest quantity of milk; the beauty of the animal, therefore, is an inferior consideration, though not altogether neglected, because it is well understood, that when a cow is turned off to fatten, those will improve most speedily which have the finest symmetry of form, and fewest coarse points about them.

Notwithstanding the introduction of several varieties, yet in some old dairies, the Gloucestershire breed of cows is still much valued: such, however, of late years, has been the love of novelty or experiment, that few "packs" or stocks are to be found in the county of an uniform composition, and fewer, perhaps, where the genuine old stock is preserved. This breed differs little in general appearances from the Glamorganshire, except in colour, which is a dark red, or brown: the bones are fine, horns of middling length, white in colour, with a black tip at the ends; their bags are thin in flesh and large, yielding a good deal of milk, and continuing it for a long time, when on good keep; a slight streak of white generally runs along the back, and always on the rump end of the tail. They are light in the carcase, usually weighing about eight or nine score a quarter, though by good feed they may be brought to twelve; and, in 1804, one was improved to sixteen, with 124 pounds of fat, and 115 of hide. Their milk is said to be less rich than some others, and therefore the breed appears for all purposes to be improved by a cross with the long-horned, which give less milk in quantity, but superior in quality, and communicate some advantages of form, which the Gloucestershire do not possess.

In the higher Vale, the long-horned cows are mostly esteemed; such as have been chiefly bred from the improved stock of Bakewell and Fowler.

On the Cotswolds, the same breed is encouraged by the principal occupiers. The Devonshire also has its admirers, and, among others, George Talbot, Esq. of Guiting, whose whole stock is of this breed. They are well suited to his farm, being little consumers, tolerable milkers, good breeders, and excellent feeders. The oxen are good workers, with a great aptitude to fatten, which they soon do, after being released from work.

The stock of a considerable occupier in the same neighbourhood, consists of Herefordshire and Devonshire. After a long trial, he concludes, that the former are the best for working oxen, but the latter for milking, and even feeding, on the stone-brash soil of his farm; allowing, at the same time, that he should prefer the Herefordshire both for working and feeding on richer soils, because they keep equally in high condition both winter and summer with the Devonshire, and, their points being full, carry a greater weight of beef of equal quality.

The merits of the Devonshire as milkers, have not perhaps been sufficiently ascertained by experiment in this county. A gentleman in the neighbourhood of Devizes, Wilts, and his father before him, have been in the habit of letting cows, to men who supply that town with milk, for the last thirty years; and as they buy all their cows, and have no prejudice in favour of any particular sort, they have at various times had all kinds: but find that the milkmen have uniformly given the preference to the Devon, at the same price, as being the best milkers on the whole.

The Suffolk duns are found on a few estates, particularly on that of Earl Bathurst, in as great perfection as the breed is capable of. They milk indifferently well, and have a great propensity to fatten.

In a county, however, so widely extended as Gloucestershire, it may easily be supposed, that cattle of almost all breeds and descriptions will be found, and every breeder will attach to his own stock some beauties and advantages superior to his neighbour; but on a general review, the following proportions may nearly be ascertained of their respective merits, as far as the practice of this county is concerned. The Gloucestershire are superior to the Herefordshire for the pail, but inferior for working as oxen, and feeding. The long-horned are on a par with the Gloucestershire in most respects, and in some have the advantage; but these two sorts, when judiciously crossed, are esteemed to form an useful breed, improving each other.

A considerable cow-keeper, who keeps a pretty large number for the supply of Gloucester, and has always been in the habit of raising his own stock, finds no breed answer so well as this cross. From the daily returns, he is able to appreciate their respective merits more accurately than the dairy-man; and he has now some that yield from two to three gallons, or more, at each milking.

Cattle of various other kinds are found mixed among the different stocks, as the Yorkshire, Alderney, Sheeted, &c.; but they are not general enough to merit particular notice, being kept rather as objects of curiosity, than for any superior qualities they possess.

MANAGEMENT OF COWS.

A pack of cows being provided, in proportion to the size of the farm, the first consideration is to mark out those inclosures for cow-pastures, which are known, either from a previous examination of the herbage, or from the experience of others, to be best adapted to the purpose of producing good milk, without being rank. The best land does not always produce the most marketable cheese; oftentimes the reverse; that is, if it has either been much manured with dung, or in any way, as by sheep-feeding, &c. artificially improved, the quantity of milk will be increased; but the quality materially altered. This is probably owing to the introduction of plants, which did not grow there before, or to the destruction of some that did. The cause does not originate with the cow, but the herbage on which she feeds. The same cow, on two pastures, separated only by a hedge, will give milk of different qualities; from one shall be made fine, rich, and close cheese; while from the other shall be made rank, "heaving," hollow, unpleasant to the palate, and unfit for the market.

In the parish of Haresfield, two grounds adjoining each other were alternately used for the pasture of cows: while they were on one, excellent cheese was made; but on the other, it was difficult to make any tolerably good. The latter had been lately well dressed with manure, which produced plants unfavourable to the dairy; and the dairy-woman herself remarked, that if the farmer continued to enrich the herbage with dung, she must give up making cheese. It is proper, therefore, that milking-cows should not be removed from one pasture to another indiscriminately, but that certain grounds, in proportion to the stock, should be assigned to their use; and this is the practice on many farms, where cow-pastures have for time immemorial been appropriated exclusively to the use of the dairy. The dung of the cow, indeed, being of a cooling nature, is the best manure for cow-pastures. Other animals, such as colts and sheep, may occasionally be let in to eat the refuse grass, but not more than one sheep should be allowed to an acre.

Among the plants which are useless, or unfavourable to the making of good cheese, are white honey-suckle *(trifolium repens)*, the different kinds of crow-foot *(ranunculus)*, and garlic *(allium ampeloprasum)*, &c.

White honey-suckle is brought forward by manure and sheep-stock, and a proof of good land, at least of land in a state of high cultivation; and hence has a tendency to raise the quality of the milk, and make the cheese heave.

All the species of crow-foot, "crazeys," "or buttercups," except the sweet-wood crow-foot (as it is said, found only in woods,) are useless, if not noxious. However their blossom may add to the beauty of the herbage, or give an apparent richness to the pasture, the milk is not indebted to them for colour, as is sometimes supposed, since the cows never crop them, if they can avoid it. See chap. 8. sect. 1.

Garlic *(allium ampeloprasum)*, common in some meadows, gives a disagreeable flavour to butter and cheese; and it does not appear that cows much dislike or refuse eating it; perhaps in consequence of its being so much blended with the grass, they cannot help cropping a little.

Decayed leaves in autumn, particularly of the ash-tree, communicate a rank and bitter taste to milk: when these, therefore, cover the ground, it is adviseable either to keep the cows in the yard, or, what is better, to rake the leaves off the pasture to the dung-heap.

The yew-tree *(taxus baccata)* should not be suffered to grow in or near cow-pastures. The leaves are poisonous to horned cattle and horses, though the berries are esteemed inoffensive. In January 1805, in consequence of some fences being broken down by a violent wind during the night, a pack of cows belonging to a farmer in Sandhurst entered an inclosed shrubbery, where were many yew-trees growing, and continued in it till the morning. Soon after they were driven out, all of them were seized, more or less, with a kind of madness, or such acute pains as made them run about in a very furious manner, sometimes leaping to a considerable height, then beating their heads against whatever opposed them, and at last falling instantly dead. Oils of different sorts were poured down their throats, as there was an opportunity of securing them, which seemed to produce a good effect on some; but notwithstanding every effort, nine out of thirty died in a few hours after they were discovered. On their being opened, it appeared that the whole quantity they had eaten, put together, would not have filled a peck.

An opinion prevails, that the leaves are not poisonous in the summer: this, however, is probably erroneous; at least it is not confirmed sufficiently by fact, to justify the farmer in subjecting his cattle to the experiment. If cattle come within reach of the yew-tree at that time of the year, they may perhaps reject it altogether, giving the preference to other green food, more palatable, and in plenty around them.

CHEESE MAKING.

While the cows are upon hay, best-making cheese is not attempted; but if the farm be near a market-town, it is more profitable to make all the milk into butter for sale, or cheese for family use.

About the first of May, the pastures are ready to receive the cows, and then begins the busy and important task of the dairy-woman.* The rennet is usually prepared some time before, and the modes of preparation are different, though all agreeing in the principal points. The following method is used in a dairy in the lower part of the Vale, from which are turned as good cheese as are to be found in the county.

To twelve gallons of water, add twelve pounds of salt, and one pound of bay-salt, or, in its stead, half a pound of saltpetre. Boil it till it will bear an egg; when cool, strain it, and add twenty-four Irish vells, twelve lemons with the rind on, and an incision made into the bodies of them, and two ounces of spice of cloves and cinnamon. The rennet is thus prepared two months before it is used. This, however, is not always the case, as in some dairies the rennet is prepared as it is wanted.

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* It may be proper here to remark, that new milk, called beestings, or " boister," is not esteemed proper for making of cheese, till ten days or a fortnight after calving; during this time, it is either given to the fatting calves, or put by to skim for making butter.

Six gallons of whey are substituted by others for an equal quantity of water, which is boiled and skimmed, till all the curd has done rising; then the vells are added. Others infuse aromatic herbs of various kinds in the rennet; but it does not appear that these additions improve the flavour of the cheese; and in some dairies they are altogether omitted.

Cheeses are divided into "best making," or "coward;" two-meal, and skim-cheese.

Coward cheese ought to be made of the whole meal of milk; but in a dairy of twenty cows, it is not unusual to set by a pan, of about seven or eight gallons, till the next milking, which is then skimmed, and added to the new meal, from which a similar quantity is taken as before. The cream thus laid by, is made into milk-butter. Coward cheeses are either thin, about eight to the hundred; or thick, generally called Double Gloucester, about four to the hundred, or even larger. The latter are made in May, June, and July, principally, and even as long as grass continues good in some dairies. Two-meal cheese is made of one meal or portion of "coward," or clean milk, and one of skimmed; the high price of butter, however, affords a strong temptation to mix two of skim with one of coward milk.

Skim-cheese is made in dairies where the whole or greatest part of the milk is converted to butter; and for this purpose it is generally skimmed twice or thrice before the rennet is applied.

It is universally the practice of the county to milk twice a-day; as early as four in the morning during summer, and about the same time in the afternoon. The cheese-tub is first " laid," that is, placed on a small " tram" or bench, and then wetted with cold water. This prevents the milk from adhering to the wood; the same is done with pails, cloths, bowls, and other utensils: when the cheese-making, however, is finished, both morning and evening, every utensil is scalded and laid by.

If the weather be of a proper temperature, (the knowledge of which depends on the judgment of the dairy-woman,) the milk is strained, and the rennet immediately added: otherwise it stands till it is properly cool; or, if too cool, enough is warmed over the fire to raise the temperature: the grand business being to raise or lower it, to a proper degree of warmth; for if it be too hot, it is apt to break up in knobs; and if too cold, it will not coagulate freely. What that temperature is, has not been satisfactorily ascertained; but from some experiments which have been made, it is about the middle between summer and blood-heat; or perhaps 90 degrees of Farenheit's thermometer may give the average warmth. The proportion of rennet is one-third of a pint to fifty gallons of milk, which quantity is supposed to make three cheeses, of ten to the hundred weight, or thirty-three pounds. Previous, however, to adding the rennet, the colouring is put in, which is made by rubbing a piece of annotto on a stone kept for the purpose, and mixing it, in a liquid state, with the milk. The quantity is determined by the shade of colour intended to be produced, without any fixed rule. This material is sold at 7*s.* per pound, and an ounce is reckoned the allowance for a hundred weight of cheese.

Fifty gallons of milk thus coloured and prepared with rennet, will " come," or turn to curd, in an hour or less: it is then gently broke with the hand, skim-dish, or knife, which employs a quarter of an hour or more. The curd is then left to sink, or collected together by drawing the skim-dish round the tub, and afterwards taking away the whey very slowly, by pressing the bowl gently down: by this time the curd becomes hard, and it is then cut to pieces in the tub in all directions, and immediately put into the vat, (which is rested across the tub on the cheese-ladder,) thoroughly broken into small particles, and well pressed with the closed hand. Some dairy-women scald the curd,* after having been finely broken, in the tub; that is, put a quantity of whey, or of water and whey mixed in equal proportions, with it, as warm as the hand can bear; or, if the curd be cold, the scalding liquor is made proportionably hot. The intention of this process is said to be, to prevent the cheese from heaving; dairy women, however, whose practice is different, say, that it is intended by scalding to get the fat out of the curd, and carry it off with the whey, for the purpose of increasing the quantity of whey-butter. Where scalding is not used, a handful of salt is commonly thrown on the curd, immediately after the whey has been "laded," or taken from it.

As soon as the scald, which also has in some dairies about a handful of salt mixed with it, is put to the curd, the whole is well stirred with the hand; then the liquor being taken away as clean as possible, the curd is well pressed with the hand, and put into the vat, where the dairy-woman still continues to crumble it fine and press it close, to force out as much as possible of the remaining whey. The curd being raised two or three inches higher in the middle than on the edge, with a cloth over it, is turned out of the vat, into which it is again returned with the cloth now at the bottom: the edges are now cut round, and carried to the middle, crumbled fine as before; it is then clothed up, that is, the overhangings of the cheese-cloth are folded over the top, a board put upon it, and placed under the press.

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* The practice of scalding prevails chiefly in the district below Gloucester; and the reason is said to be, to prevent the necessity of double pressing; that is, in some dairies, where they do not scald, the curd, after being put into the vat, and pressed for some time, is taken out again, fresh broken, in the vat, and then returned to the press for an hour, as hereafter described.

After having been pressed an hour, the new-formed cheese is taken out, and turned; then put into a dry cloth and returned to the press, where, if a morning-made cheese,* it is kept four hours; and then again taken out, turned, and, having been lightly rubbed with salt on each side, returned to the press without the cloth. The next morning the turning and salting are repeated, but not in the evening. If the cheese is small, as ten to the hundred, it is sufficient to continue the process only three days; if larger, five days. The cheese is then removed to the shelf, or "tack," within the dairy, and turned every day for a fortnight; then every other day for a fortnight more: at the month's end, it is carried to the cheese-loft, or chamber; and at this time the floor is perfectly clean. In many dairies it is the practice, about every fortnight, to wash all the new made cheeses in hot whey. This is intended to clean, harden, and improve the "coat," or skin, before it is laid on the floor. Here it is turned twice a week for three weeks; then the coat is scraped and coloured on the outside, or "painted," with carnation red, mixed with water, and rubbed on with flannel: but before the cheeses are ranged, the floor is well rubbed with herbs, such as mint, elder leaves, potatoe stalks, &c. intended to give the cheese a coat. This, however, is not the practice of all dairies. The cheeses are now regularly turned twice a week, and wiped with a cloth, and, in a month from this time, are ready for sale. The floor and cheeses are kept clean, to prevent the mites, "mints," getting into them: and it is a prevailing opinion among the dairy-women, that the herbs assist in preventing the mischief.

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* This, however, is not the practice of all dairies, though considered as a good one.

A quantity of curd frequently remains after the vats are filled; and, in this case, is sometimes laid by till the morning, then put into the tub with the scald. The cheese, thus made with two sorts of curd, is apt to be of two colours; because there being no specific quantity of colouring allowed to a given quantity of milk, there will be shades of difference in the mixture: an observation often exemplified in the streaky appearance of some cheeses. The necessity, however, of keeping the curd till the next making time, is now in a great measure set aside, by the use of hoops of various sizes, which, according to circumstances, are used on the inside of the vat, to diminish, or, by adding height, to increase the thickness of the vats.

The cheeses thus made are, at the proper season, if intended for the factor, (some time before Michaelmas,) examined by him, who, by walking over, and treading upon each of them, ascertains their saleable or unsaleable qualities, and selects those which will answer his own purpose. Those which yield to the tread, are said to be heaved, or "hoved," and unfit for the London market; and are afterwards exposed for sale in the fairs, or kept for home consumption, or sold to the small retailing shops.

Cheese-press. This machine is a cyder-press in a reduced size, but without the windlas or lever, the weight being gradually let down on the vats. A strong platform, or sill, is raised on four legs, about a foot from the floor; near the edge is made a channel all round, to carry off the whey as it is expressed, by a lip, into the pan or receiver. Two strong side-posts are mortised into the sill, reaching about six feet high; across which, about four feet high, is firmly fastened a strong bar, with an aperture in the centre large enough to let in the screw with ease. This screw is fixed at the lower part, into a heavy cubical stone, of two feet dimensions, or nearly: the upper part of the screw, having passed the perforation in the cross bar, enters a nut or female screw, large in the middle, but worked off at the two ends, fine enough to be grasped by the hand: by turning this nut, the weight is raised or let down on the cheese-vats underneath.

In parts of the county where stones of the required weight and dimensions are not to be had, a wooden frame of the same size is used, which is filled with sand, pebbles, or rubble-stones.

The screw has in many dairies been superseded by the adoption of an apparatus less simple in its construction, though more easily worked.

On the right side of the press, a third upright is raised from the floor, and connected by two cross bars, about a foot long, with the upright post parallel with it. About four feet high, a cylinder of wood, from five to six inches diameter, is inserted, passing quite through the additional upright, but kept to its place by a shoulder. To the end are fixed four spokes, or levers, or an iron handle, to which manual power is applied. A strong rope is fastened to, and coiled round, the cylinder, which, passing over a pulley let lengthways into the upper bar, proceeds horizontally to another pulley, fixed directly over the centre of the weight, and by an iron hook attached to it. Very moderate strength will raise the weight, which in this construction slides with grooves fitted to the side-posts. The mechanical powers are varied in some presses by the use of a wheel of a foot or eighteen inches diameter, instead of the pulley; but the effect is similar. In either way of working the weight, there is a superiority over the old press, and little difference in the expence.

OBSERVATIONS.

Much of the credit of a dairy depends on the neatness of its œconomy. A good dairy-woman will keep every part perfectly clean, the floors cool with cold water, and all the utensils scalded after every making. In these particulars, the county of Gloucester is exceeded by none.

Opinions differ about the cause of the heaving of cheese: the supposed consequence of land being made rank by manure or sheep-stock, has been already noticed (p. 286). Cheese, on the coming on of rain, after a long continuance of dry weather, is often observed to heave; and the obvious reason is, that the white honey-suckle being quicker of growth, gets the start of the other grasses, and for some time forms the principal part of eatage for the cows. Another cause assigned, is the too quick coming of the curd, owing either to the high temperature of the milk, or over quantity of rennet. The former might be remedied by the thermometer; the latter, by a more regular adjustment of the strength of the rennet, which, under the present management, is left too much to chance.*

A third cause is said to be the removal of cheese from a cold place to a warm loft, or chamber; to check this, the cheese, as soon as it is observed to heave, is removed, if there be a convenience, to a stone floor, which generally answers the purpose. Hence it would seem, that cheese-rooms are in general badly contrived, when situated near the roof of the house, where the cheese is exposed to the hot rays of the sun. A better situation is on the ground, with windows reaching down to the floor, that a current of air may continually pass over the cheeses, to keep them cool: or, if a ground floor were inconvenient, they should not be laid higher than the first floor, and the windows be as low as before recommended.

Though the two last may operate as accidental causes, yet it is suspected, that the rankness of the herbage is the most prevailing one. Under the management of some dairy-women, certain farms have been remarked for producing heaved cheese, whereas a new dairy-woman shall manage the same with perfect success. This is supposed to be owing to the use of some secret antidote, which either lowers the milk, or counteracts its disposition to ferment and heave. Many pretend to possess such a secret, though in all cases it does not answer the purpose.

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* It is perhaps difficult to invent a guage, or measure, which shall determine the quantity of acid contained in a certain quantity of infusion of vells; at least, I have heard of no such apparatus. A likely method is that which is adopted in some dairies, where, instead of making the rennet some time previous to its being used, a small piece, proportioned to the quantity of milk to be coagulated, is cut from the vell the overnight, and put into half a pint of water, or whey, to infuse till the morning. In this case, the vells must be supposed to be equal in goodness; and it is probable that the virtue is not so fully extracted as by a longer infusion. Might not the strength of the rennet be ascertained by a course of experiments, by the application of an alkaline salt?

A farmer came to an estate about six years since, in the neighbourhood of Gloucester, where the cheese had always been spoiled by heaving: the land is remarkably good, and to this the mischief was supposed to be owing. He, however, has had but little cheese of this description since he occupied the farm, and, as he supposes, from having always mixed with the rennet, before it was put to the milk, a table-spoonful of a solution of blue vitriol, in the proportion to twenty cows. On other farms, however, the experiment has been made without success.

From eight to ten pigs, of nine or ten score each, are usually kept to twenty cows, in and out of the sty; or, in lieu of keeping pigs, the whey is valued at two pounds for each cow by the year, and sold.

The milk of a good cow will make from three hundred and a half to four hundred and a half weight of cheese in the season; and the quantity given out at each milking will be from six quarts to near three gallons, for seven months after calving, and while she is at grass; from that period it begins gradually to diminish, till about six weeks before calving, when she is no longer milked.

Cows are liable to slip or warp their calves; and when this happens, it is esteemed dangerous to allow them to remain in the yard with the pack, through fear of the same effect being produced on the others.*

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* Some cows are perhaps by constitutional weakness, or bodily imperfection, more liable to warp than others; accidental circumstances, however, which produce sudden fright, often prove the cause. In an inclosure in Arlingham, near to which was a

In the selection of cows, it requires considerable judgment to fix on those, which, from the width of their haunches, offer a fair probability of easy calving: this is said not to be the case with the Gloucestershire breed, which are often thin and narrow behind, and therefore more liable to difficulty and mischief on those occasions.

Butter. In the making of this article, the process differs not from that of other counties. The barrel and hand-churn are both in use, according to the quantity to be made; and the times of churning are once or twice a week, according to the demand of the market. In some dairies, no milk-butter is made after cheese-making begins, but of whey-butter an abundant supply. The whey is removed from the tub or cowl, into the receivers, which are made of an oblong square form, six or seven feet long, three wide, and from four to six inches deep, with a tap-hole in some part of the bottom, to draw it off. The inside is lined with lead; and this assists in keeping up a great coolness, so necessary in the hot months; for if it were left to a high state of temperature, it would become sour in a few hours: but in this way it will stand for twenty-four hours; and, during that time, it is generally skimmed twice at least, then carried to the sty for the hogs. The cream is churned in the usual way, and produces a butter much inferior to that made from the cream of milk, and generally sold in the market for three pence a pound less than the other.

Butter-milk, or that which is left from churning, whether from the cream of milk or whey, is reckoned of

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dog-kennel, eight heifers and cows of twenty warped, in consequence, as was supposed by the farmer, of the frequent exposure of flesh, and skinning of dead horses before them: the remainder were removed to a distant pasture, and did well.

little value: where it is made in small quantities, it is sometimes saved in the whey-tub, though, according to the opinion of judicious farmers, it were better thrown away. Hence, the provincial proverb: "Whey feeds a hog, and starves a dog: butter-milk feeds a dog, and starves a hog."

Rearing dairy-stock. Calves intended to be reared, are usually continued two or three days with the dam, and during that time take as much milk as they like, which is then good for no other purpose, and is called "boister milk." Afterwards they are fed with skim-milk a little warmed. At first, they are taught to take it in, by the introduction of the feeder's fingers into their mouths; which, being supplied with milk, are sucked by the calves, as their mothers' teats; this is continued a few days, and then they will eagerly drink from the pail. A jelly made of linseeds steeped in hot water, and mixed with milk, is much used as a nourishing food. Milk is soon laid aside, and, as a substitute, oat or barley-flour is stirred in with the jelly; this is continued till they are able to eat more solid food, either oats, split beans, chopped hay, or bran, and barley-flour mixed; and about the beginning of May are turned out to good grass. They are now called weanlings. Early dropped calves are preferred for rearing; for after May they are not reckoned likely to gain sufficient strength and hardiness before the winter comes on, or a proper size by the next spring.

In the second year they are called yearlings, and are let go to the bull. It was, till within a few years, esteemed a bad practice to put them so early; but it is now even thought that this method improves them as milkers; and, from the increased value of stock, it is advantageous to anticipate a year, as a heifer in calf, at two years old, will be worth nearly as much as it would be if kept three. From this time, they continue to be milked till they are ten years old or more, unless, from barrenness or other accident, it prove expedient to fat them.

It is much the practice to fodder cows during the winter, either on pastures or in the yard: in the former case, the ground is "poached," or injured by treading, and the manure in a great measure lost; in the latter, the dung is indeed preserved, but the cattle are generally dirty, and gore each other. The better practice of tying them up in stalls, till they are turned out to grass in spring, is adopted on several farms, and will probably in a few years be general. By this method they are kept quiet and clean, are easily milked, and, in the most intemperate weather, the business is comfortable to the milker; besides that the manure is preserved without waste, and with its most enriching qualities. In a building sixty yards long, fifty beasts may be tied, each stall being seven feet in width, and one beast tied at each corner of it.

It may be suspected, that many dairy-men do not reap the full advantage of a good stock of cows, in consequence of a niggardly management of them in winter, after they have lost their milk. Straw is too much used for their fodder; or, what is equally bad, overgrown or ill made hay. It is an impolitic system, and founded on principles of false œconomy, likely to produce more loss than profit; for it cannot be expected that a cow, in low condition, should either bring a calf of equal strength, or give out as much milk, as one which has had a proper supply of wholesome and nutritious food; and it is easy to observe, that when a lean and impoverished cow calves early, she seldom thoroughly recovers for a considerable length of time, scarcely sometimes during the summer. The whole practice, indeed, of supporting young and store beasts through the winter with food that but barely keeps them alive, is improper and injudicious: the idea, that lean cattle will eat any thing, too often betrays the farmer into careless neglect in the summer, and makes him little anxious about the management of his hay; he looks forward to the consumption of it by his half famished cattle, and is even pleased with the absurd notion, that the less they eat from dislike, the greater will be the saving; but it is an obvious truth, that all growing animals require a suitable support; and it is in vain to expect strength, size, or beauty, where the supplies of nourishment are withheld, which are required to keep up the energies of nature.

Besides, it is probable that many diseases, with which they are afterwards attacked, may have their foundation in this treatment. The blood being once reduced, and the constitutional habit lowered, are with difficulty brought back to a healthy state; and the means which the farmer makes use of for the purpose, namely, that of removing them to good keep on a sudden, may occasion consequences highly pernicious, if not fatal, from repletion.

The principal diseases of the cow in this, as in other districts, are the yellows; red water or bloody urine; swellings of the udder; scouring; ulcerated teats, called cow-pock; and swelling of the carcase. For all which, except the last, recourse is usually had to the cow-leach (cow doctor). In case of swelling, or "hoven," the effects are so sudden, that there is seldom time to wait for his assistance, and it becomes necessary either immediately to let out the wind by an opening in the flank, or disperse it by internal medicine. One used for this purpose is tar, inclosed in the shell of an egg, and forced down the throat, with exercise.

Succulent herbage, eaten with eagerness, and with little exercise, is the cause of this disorder. On the morning of the 26th of July 1805, two cows of about twenty, at Hempstead, were found dead in a pasture, where they had been kept for some weeks; no cause could be assigned but over eating of white clover *(trifolium repens)*, with which the herbage abounded, in consequence of rain after a series of dry weather.

Calves are liable to the disease called the hoose, or husk: it is a pulmonary complaint, and supposed to arise from the strong dews, or hoar-frosts, which, in the autumnal season, are found on the after-grass of the Vale. The danger may be lessened by an early application to medicine; but notwithstanding every effort, many die before winter, in consequence of this disease. In this, and all other complaints of cattle, the old remedies, which have been handed down for ages, are now in a great measure superseded by the methods of cure recommended in a Treatise on the Disorders of Cattle, &c. by J. Downing. The modes of treatment recommended in this publication, are founded on such rational principles, and enforced by experience, that it ought to be in the hands of every farmer.

Calculation of Profit on a Dairy of Twenty Cows.

DEBTOR.	£.	s.	d.
Rent of forty acres for pasture - -	60	0	0
Rent of twenty acres for hay - - -	30	0	0
Making hay, at 12*s*. per acre - - -	12	0	0
Carrying and ricking - - - -	3	0	0
Tythe, at 2*s*. 6*d*. per pound - - -	11	5	0
Poor and highway rates, at 3*s*. - - -	13	10	0
Two women to milk, at 3*s*. per week -	7	16	0
Dairy-woman, at 4*s*. 6*d*. per week - -	11	14	0
To a labourer in winter to fodder - -	4	10	0
To wear and tear of dairy utensils - -	3	0	0
To salt - - - - - - - -	3	0	0
To annotto, at 7*s*. per *lb*. - - - -	1	15	0
To interest of money laid out in stock and implements (reckoning each cow at 20*l*. and chance of losses) - - - -	40	0	0
Profit - - - - - - -	136	10	0
	338	0	0

CREDITOR.				
Cheese, four ton, at 4 cwt. each cow, and 3*l*. 3*s*. per cwt. -	£.252 0 0			
Value of whey - - - - -	40 0 0			
Pasture for colts and sheep -	10 0 0			
Profit of calves - - - -	21 0 0			
Profit of butter - - - -	15 0 0			
		338	0	0

In the foregoing calculation, the dairy-man is charged with expences higher probably than he really incurs; because the work being seldom performed in the way there stated, the servants are engaged in many other parts of the business belonging to the farm and family. The whey is also charged at the price for which it may be sold, without calculating the increased profit when used as food for store pigs.

Prices of Dairy Utensils for Twenty Cows.

	£.	s.	d.
Cheese-tub, or cowl - - - - - -	1	10	0
Sieve and milk-bowl - - - - - -	0	3	0
Barrel-churn, iron work and stand - -	2	12	0
Vats lined with lead - - - - - -	3	3	0
Or two whey-skeels for the same, 2*l.* 2*s.*			
Three milk-skeels - - - - - -	1	5	0
Three milk-pails - - - - - - -	1	0	0
Six cheese-vats - - - - - -	0	18	0
Two butter-skeels - - - - - -	0	10	0
Lade or gallon (" gawn") bucket - -	0	1	6
Skimming-dish - - - - - - -	0	0	10
Pair of butter-scales - - - - -	0	3	0
A brass-pot for warming the milk - - -	2	0	0
Cheese-press and cloths - - - -	10	10	0
	23	16	4

SECT. II.—SHEEP.

The principal breed of sheep of this county, is that of the Cotswolds; large and coarse in the wool, at three years old generally weighing from twenty-two to thirty pounds per quarter, and capable, by forced feeding, of being made even forty-five pounds: at the same age it produces nine or ten, and sometimes more weight, of wool per fleece.

The pure breed, however, is become scarce, in consequence of the introduction of the new Leicester, by which it has been in some points improved. The wool is shortened and made finer; and the carcase, though lighter in weight, is more compact, the bones finer, the neck smaller, and the best parts covered with flesh and fat.

The Cotswold sheep have also been crossed with South Downs, the principal advantage of which lies in the improved fineness of the wool. The experience, however, of a few years, has raised different opinions as to the advantages of either cross. The more they partake of the new Leicester, the greater is the loss both in size and quantity of wool; but to this it is answered, that, admitting the true bred Cotswold may produce more wool per *fleece*, and more mutton and bone per *quarter*, yet the new Leicester will probably produce more wool and mutton per acre; because, from their aptitude to fatten, they will require less food for their support, consequently bear a larger stock on any given quantity of land or food.

Breeding for mutton, however, and breeding for wool, are distinct and different objects, and will in some measure depend on situation; for those soils which produce the finest wool, are not adapted to raise the greatest weight of mutton: and, on the other hand, those soils which fatten most, in equal proportion deteriorate the wool, it being a fact ascertained by experience, that wherever fine woolled sheep have been introduced on more luxuriant soils than where they were bred, or accustomed to, the wool has increased in quantity, but become coarser in quality. A farmor, therefore, will be directed in his choice of flock by the consideration of food and situation; if these circumstances are favourable to the increase of mutton, the new Leicester, as a cross with any other, seems to have the advantage; but if they are more favourable to the improvement of wool, the South Down may perhaps claim the preference.

The fashion of the present day leads the breeders of all descriptions much into the desire of producing the largest and fattest animals; but it is very questionable, whether either of these objects be any farther useful, than to shew what *may* be done by different modes of feeding and food. Animals which possess true symmetry and proportion, will always thrive the most and cover the thickest; and these are considerations that never should be abandoned. Profit to the breeder, and produce to the consumer, are the two grand objects of pursuit; to this our attention and experiments should be directed; and if the increase of mutton be prevented by the attempts to improve the quality of wool, the latter should become only a secondary consideration. To the farmer it is of little consequence, whether the wool be coarse or fine, if the return of money be the same; or whether his stock consists of large or small carcases, if he can make them equally ready for the market; but it is of material consequence, both to him and the public, that the greatest possible quantity of meat, with a reasonable proportion of fat, should be fed on a given quantity of land, and that other considerations should yield to the supply of that produce which affects the support of life.

The following are the opinions of some gentlemen and farmers in different parts of the Cotswolds, who have paid attention to the properties of sheep, either in their native or crossed state, or introduced from other counties.

Sherborne. A considerable difference of opinion prevails here, as to the merits of the Cotswolds and new Leicester, though even the advocates for the old native breed allow a cross from the latter, if not carried too deep, to be an improvement. Lord Sherborne's flock is a well-bred, and true formed new Leicester breed.

Northleach. The breed here is a mixture of the Cotswold and new Leicester, but partaking more of the former than latter. They are sent to market from the beginning of April to the middle of May, and average about twenty-five pounds per quarter.

Fairford. The new Leicester chiefly prevails. J. Raymond Barker, Esq. considers his flock as much improved from this breed.

Coln St. Aldwyn's. Here a new Leicester ram has been put to South Down ewes, and the produce re-crossed with a South Down ram. The form of the South Down is said to be improved by the new Leicester, and the wool increased in quantity, though diminished in quality. The mixture with the South Down is preferred, because the ewes are better nurses, and more productive of milk.

Temple Guiting. G. Talbot, Esq. has a flock of the best South Down, which in general run on a common in the day, and are folded on the tillage land at night. He prefers this breed to the Cotswolds, because a greater number will depasture on a given extent of ground; because they are more hardy, and require less attendance from the shepherd; because they are better nurses of their lambs, and in general bring and rear a greater number of them; and because they will fold with less injury to themselves, which is a considerable object on a poor soil, equally benefited by the treading as by the manure left from the folding.

Shipton Moigne. Sheep are not bred here; but, to keep up the stock, the farmer buys in Wiltshire ewes in October, and immediately puts them to a ram of the new Leicester breed: in the spring, the lambs are fed, and afterwards the ewes. It is supposed, that by this cross, the lambs grow fat much sooner, than if got by Wiltshire rams.

Speaking generally of the Cotswolds, the opinion is in favour of a cross with the new Leicester, though pure Cotswold sheep are still found on several farms. At Daglingworth and Hampnett are to be found the largest and purest flocks of the old breed.

The Vale is not distinguished by any peculiar breed of sheep. The rot exists in too powerful a form to encourage the farmers to breed much, for a permanent store. On this account, the stocks are generally renewed every year, by purchasing ewes in autumn, fattening the lambs in spring, and the dams in the course of the remaining year. The sort mostly used in the lower Vale, is the Wiltshire, and a few from Somersetshire: on the commons, a few miles above and below Gloucester, which are liable to inundations, the Ryeland breed, which is the same with the Herefordshire, answer best: they soon fatten, which is attributed to the change of soil and food, and to the extent of ground they run over—a circumstance favourable to sheep of all descriptions. In wet summers, however, the rot, or bane, frequently destroys the greater part of them. On the uplands, which are out of the reach of land-floods, this disease is less destructive, and a permanent stock is kept up, chiefly of the Cotswold and Ryeland breed.

The Ryeland, or Herefordshire sheep, are bred in that part of the Forest district which lies in the neighbourhood of Newent, and from thence to Bromsberrow; and take their names from the lands where they are found in the greatest purity. They are smaller than any others, except perhaps a few peculiar to the Forest of Dean, seldom, in an unmixed state, exceeding twelve or fourteen pounds a quarter, at three years old, unless forced by extraordinary keep. They have white faces, and no horns; beautiful and compact in their form, fine in flesh, and of a delicate flavour; their wool is fine, and bears a superior price; so that, in 1804, when the coarse wool of the Cotswolds was at 1*s.* per pound, the Ryeland trended* was sold for 3*s.*

The Ryelanders, by crossing with the new Leicester, and black-faced Shropshire, have been considerably increased in carcase, and made to weigh from fourteen to eighteen pounds per quarter: in proportion, however, to the improvement in weight, the wool becomes coarser, and, though more in quantity, less valuable. Thus crossed, the wool increases from two to four pounds per fleece.

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* Trending of wool, is freeing it from filth, and is done by persons, called trenders, appointed and sworn for the purpose. Best wool is always understood to have gone through this process, and is then worth 2*s.* 6*d.* or 3*s.* more per tod than other untrended wool. The fleeces are neatly rolled together, and bound with osiers, or "withs." The tod at Gloucester is 28½*lb.*; and the stone 12½*lb.* for wool.

It is said, that the cross with the Leicester, and others of coarser wool and larger size, has introduced among these sheep the shab, a disease not before known on the Ryelands; and on this account the breeders are endeavouring to recover the original breed. This disease is the consequence of the increased length of the wool.

Ryeland sheep are quiet in pasture, and have a great propensity to fatten, which is increased by the cross with the new Leicester; but if they are capable of any great or general improvement, it will probably be best effected by a cross with a South Down ram; the carcase would thus be "let out," or increased, to a greater weight, without lengthening or making the wool coarser.

The practice of "cotting," or penning up the sheep in houses at night, on the Ryelands, formerly much in use, is gradually wearing away. By this mode the wool was supposed to be improved, and a quantity of manure was collected, oftentimes to the depth of six feet or more; but the advantage of the sheep lying on a soil little more compact than sand, was lost.

The principal markets for sheep, are at Gloucester, Stow, and Newent, in this county; Burford, in Oxfordshire; and Ross, Herefordshire.

At Gloucester, Cotswolds, Ryeland, and Welch, are principally penned. At Stow and Burford, the Cotswolds; and at Newent and Ross, the Ryeland.

The difficulty of improving carcase and wool at the same time, is generally admitted: very spirited attempts, however, are now making in this, and some parts of the adjoining counties of Wilts and Somerset, to improve the quality and quantity of fine wool, by a cross betwixt the Ryeland, South Down, or Wiltshire, with Spanish rams. It is well known, that the first Spanish sheep were imported by his Majesty, from whose flock they have been distributed into various parts of the kingdom.

Dr. Parry, a physician of Bath, has taken the lead in this improvement, and recommended the practice, and described the effects, in an interesting publication on the subject.

Lord Somerville, has also imported a number of ewes and rams of the finest woolled sheep, from Spain, at a great expence. His Lordship has a flock of about a thousand, either entire Spanish or crossed with the Rye-lands. Dr. Parry has about the same number.

Mr. Sheppard, an eminent clothier of Uley, has embarked deeply in the experiment. He has a collection of about a thousand of the purest Ryelands that could be procured; and, from three or four years close and scientific attention, he is enabled to speak in the most favourable manner of the high advantages likely to be derived from this cross.

Mr. Lloyd, also another considerable clothier, and occupier of a large farm on the lower Cotswolds, is engaged in making the experiment on a large scale, for the purpose of ascertaining how far this kind of stock will answer to the Hill farmers; (an experiment of great importance to them;) and, by manufacturing the wool himself, he will be able to fix the value of the result as a manufacturer.

The Bath Agricultural Society is entitled to much praise, for the uniform encouragement it has, for many years, held out, by premiums and bounties, and by its countenance on all occasions to the promotion of this great source of national wealth and prosperity.

It has been supposed, that in this cold climate, the wool would degenerate, and become coarser; but there is reason now to conclude, from the experience of fourteen or fifteen years, during which these experiments have been going on, that the quality is capable of being *improved* by the climate, instead of being deteriorated, and that it may become finer than the original Spanish.

It is a mistake to suppose that the mutton of the Spanish or mixed breed of sheep is not so good for the table as others; whereas, in fact, it will be found equal at least, to any other sort of mutton whatever.

It is observed, that about the fifth dip (as it is called) from the Spanish blood with a Ryeland ewe, brings the wool to an equal degree of fineness with the true Spanish, and the fleece will be improved to three or four times its original value, partly in quantity and partly in quality.

These experiments are not made under the idea of superseding the use of Spanish wool, but to counteract that spirit of monopoly which prevails in the trade of that article, and from an opinion that, possibly, the commercial intercourse of this country with Spain may, at some future period, be put under such restrictions, particularly with regard to wool, through the intrigues of the French, as that it may be almost impossible to obtain it at a reasonable rate; and, lastly, that the increased expedition with which wool is worked up into cloth, by the general introduction of machinery, requires a supply beyond what has been usually imported. How far it was good policy to admit the introduction of machinery into the clothing manufacture, is a question not now to be agitated, because it has been long introduced, is now in general use throughout the kingdom, and cannot be withdrawn from this county, without giving up the manufacture altogether, to the entire ruin of the poorer class of people employed in it; but as it has the effect of working up wool with much greater expedition than manufacturing by hand (as it is termed), it tends materially to increase the consumption, and of course to raise the value of fine wool in proportion; and, therefore, is a matter of very high importance to the landed interests of this county, and a reason why the improvement of fine wool calls for our closest attention and unbiassed investigation.

Two questions, however, of considerable importance arise on the subject, which require to be satisfactorily answered, before the policy of the new system be allowed. First, will the encouragement given to the growth of fine wool lessen the quantity of animal food, since an increasing population imperiously calls for a contrary effect? The quantity of meat does not seem to depend on the size of one carcase so much, that an equivalent may not be provided by many, with the same quantity of nutriment. A prime consideration is, whether the animal has an aptitude to fatten, and that too on the best points. The form of the Ryelander is in all respects adapted to the carrying of flesh and fat. The neck is fine, the legs short, the haunches full, and the bone remarkably small; so that it is doubtful whether the breed is capable of much improvement, except in wool: but if several Ryelanders may be fatted to the same collective weight, as a smaller number of a larger breed, without a greater consumption of food, and without diminution in the quality of wool, the advantage is in their favour; and if the cross with the Spanish does not lower the flavour of the mutton, or lessen the aptitude to fatten, these experiments which are now making, will probably produce great national good. Secondly, Is the present quantity of coarse wool, grown in the united kingdom, large enough to allow a considerable portion to be drawn from the regular demands of the manufacturers? It is asserted, that the consumption of coarse wool is equal to the full growth within the year, and that every pound taken from it, takes away so much employment from the labouring manufacturer, and eventually raises the price of coarse cloths. If this be fairly made out, the new system will be attended with considerable risque; but I do not know that the fact has been fully substantiated by evidence.

DISEASES OF SHEEP.

The principal are the rot, the shab, white water, maggots, and giddiness.

The rot, or bane, is a disorder of the liver, which in those that are much diseased, is covered with "flukes" or small flat insects, in form like a flounder. It is probable that the disorder might be prevented, or checked, by changing the sheep to dry pasture, and dry food; by folding them in the yard during night, and till the dew is gone off, or by giving them salt. The use of the latter is sufficiently experienced on the salt marshes, where sheep never rot. When the disease has been some time on the animal, no certain remedy has as yet been acknowledged to be discovered, though many have been apparently successful; and attempts have of late years been made, not without fair expectations, by the application of turpentine, &c.: the Vale farmers, however, avail themselves of their increased propensity to fatten in the early stages of the disorder, and by good keep soon make them fit for the market; but in a little time they begin to fall back again, and lose their strength and flesh. Hence it is unsafe to drive them far before they are slaughtered, as they soon sink under fatigue. Fortunately warm moist summers do not often occur; it is now about ten years since the last. It is a common opinion, that ewes with sucking lambs do not rot.

The shab is a disease of the skin, to which long-woolled sheep are more or less subject. Taken early, it is easily cured by an infusion of tobacco in water, or sulphur ointment. Mercurial preparations are also used: a small proportion of corrosive sublimate, dissolved in spirits of wine, may be safely mixed with the tobacco-water: mercurial ointments, however, are required to be used with caution, where the disorder has made great progress, and much surface exposed; and the sheep should be kept in a warm place during the use of it.

White water is a destructive disorder on the Cotswolds; usually comes on with rapidity, and sometimes terminates with death in three hours. It is supposed to be owing to their licking up the white frost on their green food in spring and autumn. Folding at night on bare ground, giving them dry meat in the morning, and keeping them from the turnips till the frost is gone, is the obvious mode of prevention, if the foregoing cause is well founded. If, however, the disorder is owing to gorging themselves with watery food, such as turnips, it is probable that to keep them moving, without suffering them to rest long, nor swell with what they have eaten, will carry off the beginning complaint; and even if the white frost has been the occasion, this is the best remedy that reasoning suggests; and it is said to be the practice of the shepherds in Northumberland.

Maggots are not so much a disorder as the effect of a certain degree of neglect; where it comes to a very virulent state, it may be deemed a proof of great negligence. The commons in the Vale present sad instances in abundance of miserable sheep, which are really eaten up alive. In some well attended flocks on the Hills, it seldom appears, and never gains much ground; for, to prevent the progress, the flock is individually examined twice a day, during the warm days of summer, when the flies are depositing their eggs. If any eggs, or "blows," escape observation, and form to maggots, the wool is sometimes cut off, and the affected part having been cleared with the point of the shears, is rubbed with the tobacco infusion before mentioned, or ointment made with sulphur, white lead, or mercury; but as this operation renders the coat unsightly, it is a better practice to open the wool with the fingers, and shake in a powder of white lead solely, or mixed with a small proportion of white precipitate *(calx hydrargyri alba)*; but if a wound is already formed by the erosion of the maggots, the same powder, in the form of unguent, is most proper.

Giddiness, or the "blood," is a fatal disease, considered as the consequence of great fullness of blood, and usually attacking sheep which are removed from poor to rich keep, and particular young luxuriant grass in May. The effect is sometimes momentary; at other times the animal runs round as in giddiness, and after some exertions falls dead. As a preventative, it is useful to bleed moderately, before the sheep go to new pasture; and when attacked by the disease, if there is time, the same remedy offers itself; and the practice of the farmers is to cut off part of their ears or tails immediately, to promote a plentiful discharge, and freer circulation of blood, which is often attended with the desired consequence.

This change of pasture sometimes brings on, as in neat cattle, a swelling or distension, which, unless timely discovered, and counteracted in its progress, by motion and dry food, ends in death.

Lambs run with their dams, whether intended for the butcher or store, till they are fat, or weaned. The practice of shearing them with the sheep, intended for store, gains ground through the county: besides the advantage of the first clipping, the produce of wool is said to be in favour of them at the second shearing, in preference to those which retained their wool. A respectable farmer, of Beverston, selected forty of his best lambs; half of which he had shorn, and the other continued depasturing till the clip-day following, without having lost their wool: then it appeared that the former had the advantage of the latter, both in point of wool and carcase, the wool being more by two pounds, and the carcase better by 2*s*. a head.

When the lambs are turned out to pasture, it is common, particularly in the Vale, to colour them about the neck and other parts with a species of red ochre, called reddle, with the view, as it is supposed, of deterring foxes from carrying them off.

SECT. III.—HORSES.

This county is not distinguished by any particular attention to the breed of horses, nor are even the best of other counties purchased for the team. It cannot be said, that no horses are bred in the county; because every farmer almost of any consequence has a breeding mare; speaking generally, however, it may be said, that the fairs receive their most considerable supply from the counties of Warwick, Stafford, Derby, and Lincoln. The native breed are strong and boney, intended, when sold, for the London drays or heavy carriage. It is no reflection on the judgment of the Gloucestershire farmers, that they are indifferent about the breed of horses, since a stock of this kind, unless it be of a very superior sort, cannot be productive of any great advantage on land so highly rented.

Though few horses are bred in the county, many are bought and sold at the different fairs, particularly at Stow-on-the-Wold, where a great variety of good horses are brought for sale, and many dealers from London and other places attend to purchase them.

Horses and Oxen compared as to their use in Husbandry.

The operations of husbandry are more generally performed with horses than oxen, in the Vale, where the soil is heavy, and will not bear much treading. On the Cotswolds, on the sandy lands of the Forest district, and in the southern parts of the Vale, oxen are generally used; one team at least, on most large farms.

The Herefordshire breed have the preference, for two reasons; first, because they are smaller in the bone, and more active than the Gloucestershire, northern, or long-horned; secondly, because they are more profitable, going on with less food during their work, and, when put to the stall, from their aptitude to feed, producing more beef, with less food, and in less time.

Wherever oxen have come into use, the advantages of them have been great; and it seems to be more the effect of ancient prejudice than experiment, that they are not used with profit even on stiff soils. At Shipton-Moigne, a principal farmer employs an ox-team on strong clay land; they go single, and do as much, if not more work per day, than any horse team in the parish.* It is, however, true, that there are some situations where they cannot be employed with the same advantage. The country about Shipton-Moigne is in general more level than the northern Cotswolds, and therefore not liable to the objections which lie against the use of oxen, in parts where the surface is much and frequently broken and interrupted with steep acclivities. In frosty weather, on the slippery steeps which rise out of the vallies, they are not calculated for the carrying manure at the season when that work is best performed; nor can they bear the heat of summer like horses: this is an objection which may appear general; but it is to be remarked, that the rays fall, and are reflected more directly, and with greater intensity, on exposed slopes, than horizontal surfaces, where the ground is more uniformly level. On light loams, or sands, a question cannot arise as to the utility of oxen, and numerous are the testimonies which might be produced. Mr. Ludlow, when at Winterbourn, used an ox-team with a double furrow-plough, and finished from two to three acres a day, in the most satisfactory manner. From a report made by Mr. Billingsley to the Bath Agricultural Society, in December 1804, of an accurate experiment in the neighbouring county of Somerset, it appears, that, of a farm of 800 acres, he ploughed 580 with one team of oxen, and a yoke in reserve, within one year; the whole cost only 4*s.* 10*d.* per acre, ploughmen, &c. included.

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* It has been asserted by some writers on agricultural subjects, (*see Baird's Survey of Middlesex, p.* 41, *note,*) that oxen will not stand constant work on hard roads. This doctrine, however, is opposed by the following fact.

T. Estcourt, Esq. of Estcourt, near Tetbury, M. P. a few years since employed a team of horses and another of oxen, for two years, during the time his house was building, for the purpose of drawing timber and other materials, great part of which was brought from the distance of fourteen miles. The team of four horses, and the other of five oxen, used to go twice every week; they set out together in the night, and returned the next day; but it was observable, that the oxen so far out-walked the horses as to be at home about two hours before them. The horses were black, stout, and able; the oxen of the Herefordshire breed, and they brought the same weight. They were worked in harness, as horses, and shod; and their shoes lasted generally as long as those of horses. Their food was grass in summer, and hay in winter, but no corn. Hence it appears, that oxen will, if properly tutored to it, walk with a load as fast, and work on the road as well, as horses. *Extract from a Communication of T. Estcourt, Esq. to the Board of Agriculture.*

It is unquestionably much to be desired, that the use of oxen for draught were increased, not only as the means of bringing to the markets a more abundant supply of beef, but also of diminishing the amazing and alarming consumption of grain for the support of horses.

It is said, that 3,250,000 quarters of oats are annually consumed by horses in this kingdom; that is, the produce of 1,300,000 acres. Under the present circumstances of this nation, when a slight untowardness of season produces crops deficient, and unequal to the consumption of our inhabitants, and throws us on the accidental abundance of foreign markets for a competent supply, the expensive maintenance of so many horses becomes a serious evil; an evil, however, more likely to be lamented than remedied; since it is too much to expect a dereliction of pleasure or interest, on any large scale, for the public good. The gentleman will no more be inclined to resign his favourite stud, than the carrier or the farmer the advantages of his draught horses: the carrier, indeed, from the mail-coach to the caravan, is well aware that no substitute can be offered him, and therefore has no inducement to relinquish his present practice; but the farmer, differently situated, has it proved to him from fact, that, for the mere cultivation of his lands, there is a decided advantage in the use of oxen: for some purposes they are not calculated; but on all farms, except those of a very limited extent, there is sufficient employ for one team of each; and certainly, when it is considered that oxen are maintained at less expence, with a saving of two parts in three; that they are less liable to disorders, and require less attendance; are easily brought into the habit of working, are capable of doing nearly as much work as horses, and are every year rather improving than otherwise; it is a matter of surprize, that they are not more used in the cultivation of large farms. On small farms, they cannot conveniently become general, because one team of horses is indispensible; and therefore the farmer must be contented with that, unless his occupation be equal to the keeping of both.

SECT. IV.—HOGS.

The farmers of this county are not particular in their breed of hogs. All sorts and mixtures are found on the different farms, the greater part of which are purchased in other counties, and sold out in Gloucester market. The sort most frequent, is a mixture of the Berkshire with the slouch-eared, or tonkey. The old Gloucestershire breed, standing high, long in the body, and white, are seldom met with in an unmixed state, nor then much esteemed.

The usual food of hogs, before they are put up for fattening, is whey, and the refuse of the kitchen. On some farms, they are allowed the range of the homestead for grazing; in which case they are prevented from "rooting," by being "rung" with iron in their noses, and prevented from straying by a yoke.

SECT. V.—RABBITS.

The agriculturist will look with a jealous eye on the appropriation of land to any other purpose than the raising of the necessaries of life; and, on this principle, rabbit-warrens are generally considered as so much lost to the community. There are possibly some tracts of country either so bare of soil, or composed of sand so keen and infertile as to be applicable to no other purpose; such, among others, is Milborow Heath, in the manor of Thornbury. Warrens are, however, fast decreasing, and will more so as inclosures increase. The extensive warren near Winchcomb, considered till lately as unlikely to make any adequate return, is now under cultivation, and promises amply to reward the spirit, and remunerate the expences of the undertaker. The loss of wild rabbits is in a great measure made up in the market, by the breeding of tame ones, which, managed well, and kept clean, are by many persons preferred. The price of rabbits in Gloucester is 2*s*. 4*d*. per couple out of the skins.

SECT. VI.—POULTRY.

The breed of poultry has been represented as diminished, by the decrease of small farms; but the remark does not appear to be well founded. The most satisfactory mode of judging seems to be from an observation of the markets, where the supply is so far from failing, that the number was never known to be greater. That the price of this article should keep pace with others, is to be expected; but that it has risen in an undue proportion, may reasonably be questioned. Three reasons may be assigned for the increased price of poultry, in addition to the general one before-mentioned, as far as regards this county.

First. The superior and more expensive mode of preparing them for the market. A few years since, they were offered for sale, only with the advantages derived from the barn-door; now they are fattened by hand, with the best of corn, with the most attentive regularity, and as much system as any other stock belonging to the farm; and it is surprizing to see in what degree of delicacy and perfection they are brought to the common market.

Secondly. Poultry, like other commodities, are in a great measure thrown into the hands of middle men, called feeders, and often pass in large quantities to the higler, or carrier, for the supply of distant markets; and it is scarcely necessary to remark, that the price of any article will, in a certain degree, be increased in proportion to the number of hands through which it has passed. In a farm of moderate size, the minutiæ of attendance on concerns confessedly inferior, must necessarily interfere with objects of greater consideration; and therefore it becomes a matter of convenience to dispose of the poultry to others, who will take the trouble of feeding them for the market to that height of delicacy which the refined taste of modern times requires.

Thirdly. The great consumption occasioned by the visitors of Cheltenham and Bath, materially affects the demand in this county, and consequently the price. Live and dead poultry are carried off in astonishing abundance from the markets, by men who gain a livelihood by it.

These circumstances considered, one should neither be surprized at an enormous advance of price, nor at a scarcity, if that really was the case; but in truth efforts appear to have been made to keep up the supply, in proportion to the increasing demand and consumption. From an attentive observation, therefore, of what passes on farms of all descriptions, it is difficult to concede to the opinion of some writers, "that the want of that redundancy of live stock which the cottager used to raise on his little farm, and was obliged to carry to market as soon as reared, is one cause of scarcity and dearness of poultry, pigs, pork, and eggs." Whatever may be the case with poultry and eggs, surely pigs and pork must always be a matter of attention, even with the greatest farmers. Eggs are often from nine to twelve for *6d.* and, considering the highly increased consumption of this article, both from the modern fashion of eating them at breakfast, and their very extensive application in fining of wines, it is rather to be wondered at, that the market is supplied at a tolerable price; but what food is cheaper than eggs at the price just mentioned? The average price of fowls at Gloucester is *3s. 6d.* of ducks *4s.* per couple; of a goose, about the same, or more, if of large size; and of a large cock turkey *10s. 6d.* all out of their feathers, and trussed: if alive, as they come from the barn-door, about a fourth less.

SECT. VII.—PIGEONS.

The principal dovecotes in the county, are to be found in the district of the Middle Vale: that is, about Gloucester, and some miles above it, also on the hills. The great inducement to the breed of them there, was the large open fields of corn, and particularly of peas and beans: but as the land is fast reducing into small inclosures, the pigeons will probably decrease in number, as they will be less protected, and more exposed to secret enemies: for the havock they commit in all stages of growth, from the first planting of the grain or pulse, to the time of its being secured in the rick, will ever raise them a number of enemies, among those who are not interested in their preservation. No doubt they form an article of considerable profit to the farmer in long established and well stocked dovecotes, and are valued pretty high in the calculation of rent; but it is probable that the mischief they do in the fields would not be compensated by the profit, if the loss occasioned by their maintenance was to fall on the owner alone. In an agricultural point of view, they are doubtless a nuisance; some other birds, as well as pigeons, destroy grain, but they also assist in lessening the increase of grubs and insects; whereas pigeons, being entirely granivorous, and withal extremely voracious, cannot be supported without large allowances; and supposing a flock of a thousand to devour a bushel per day, and less will scarcely keep them alive, the consumption, in a country where they are abundant, must be severely felt. The average price in Gloucester market is 6*s*. per dozen.

SECT. VIII.—BEES.

Whether it is practicable, in this climate, to bring the management of bees to that state of perfection as to make it an object of much importance, is to be questioned; the scarcity of stocks in this county is rather a proof, that long experience has decided against it, since it is probable, that a pursuit, attended with little expence, but almost certain profit, would not be abandoned, if there were not some strong reason for it: the changeableness of the English climate, renders half the summer unfit for work, and the plants which bees are most fond of, are rare. Certain it is, that the bee-hive is no object of the farmer's attention; and the few that are to be met with in the county, are generally at the cottages of the poor. In no instance that has fallen under my observation, have the stocks amounted to twenty.

The average produce of a stock is from thirty to fifty pounds of honey, besides wax. Honey is worth from 10*d.* to 1*s.* per pound. Hence it appears, that the annual profit is considerable; and the means of getting it being within the reach of every one, the bee-hive should be the regular appendage to the poor man's cottage.

This summer (1805), the bee-hives have been unusually injured by the immense quantities of wasps which have infested the country; and probably the greater part of the stocks of bees will die for want of food, during the ensuing winter, in consequence of the ravages committed by these plunderers.

CHAPTER XIV.

RURAL ECONOMY.

SECT. I.—LABOUR.

THE price of labour and rate of wages vary in different parts of the county, and, in the neighbourhood of large or manufacturing towns, of course are highest. Every thing which the farmer can reduce to the "great," or piece, he does. The prices of this kind of set work will be found in the Appendix.

The general price of agricultural labour per day, through the year, except during harvest, is 1*s.* 6*d.* and about a gallon of drink. This will hold as an average through the greatest part of the county, except on the Cotswolds, and in part of the Forest district, where it is somewhat less, and in the neighbourhood of Bristol, and in the manufacturing country, where it is more, with the same allowance of drink. In the time of harvest, when hands are much wanted, almost every working man will put a price on his labour, agreeably to the emergency of the case; but, generally speaking, he has 2*s.* a day, with three dinners in the week, and six quarts of drink. The women at the same time receiving the same allowance of victuals, with three quarts of drink, and from 10*d.* to 1*s.* per day.

The farmers keep no more in-door servants than are absolutely necessary to look after the team, and females for the dairy—a man and boy to a team of five horses, and two females to a dairy of twenty-five cows: the men-servants generally assist in milking, and the dairy-girls do also the business of the house, the mistress superintending and assisting in the business of the dairy, without which it is seldom well performed. The wages of in-door servants by the year, vary from 4*l.* to 12*l.* according to age, strength, and qualifications; of women, from 4*l.* to 6*l.* including maintenance, lodging, and washing.

Hours of labour are from break of day to dusk, in the winter; and from six to six in the summer, except during harvest, when they work earlier or later, according to the circumstances of the weather.

Drink is expected by workmen on all occasions, whether piece or day-work, and in all parts of the year, through the Vale and Forest districts; but on a great part of the Cotswolds it is not allowed, except during the summer; and even then some farmers allow them a quantity of malt to brew for themselves, which produces temperance and economy in the use of it.

SECT. II.—PROVISIONS.

The prices of provisions are nearly as in other counties equally distant from the metropolis, and supplied with the same easy means of conveyance.

The following Table exhibits the present rate—March 2, 1805.

	£.	s.	d.
Beef by the quarter, for a stone of eight pounds	0	3	8
Best wether mutton, ditto	0	4	8
Veal, ditto	0	4	8
Bacon green, by the flitch, ditto	0	4	4
Bacon dried, ditto	0	5	4
Pork, ditto	0	4	4
Best double Gloucestershire cheese, per cwt.	4	0	0
Best single ditto	3	3	0
Two-meal ditto	2	16	0
Butter, per pound	0	1	3
Wheat, per quarter, Winchester measure	4	16	0
Barley, ditto	2	16	0
Oats, ditto	1	8	0
Beans, ditto	2	16	0
Peas, burbage, for hogs, ditto	2	16	0
Peas, white, for boiling, ditto	3	12	0
Potatoes, per sack, weighing $2\frac{1}{2}$ cwt.	0	8	0
Apples, on account of the scarcity, per bushel	0	8	0

SECT. III.—FUEL.

In the immediate neighbourhood of the Forests of Dean and Kingswood, coal is of course a cheap and reasonable article; but in other places dearer, as more or less distant from the pits. In the former district, coal is sold at 7*s.* per ton, and at the latter 3*s.* per quarter of eight bushels; or, if a bushel be reckoned at half a hundred weight, about 7*s.* 6*d.* per ton.

At Gloucester, the Staffordshire and Shropshire are chiefly made use of, except in times of great scarcity, occasioned by want of water in the Severn, or long continued frost, when the Forest coal is brought in by land carriage. The price of the first is 20s. of the second 18s. per ton, on Gloucester Quay; of the last, delivered, 22s. or more, according to the distance and state of the roads. Either of the two first are superior in quality to any which is raised in the county, and therefore, independent of difference in cost, they are preferred. Both are conveyed down the Severn in barges of from sixty to eighty tons burden.

Wood is seldom used as fuel, except on farms, which are sufficiently timbered to afford a supply. This, however, is rarely the case; and therefore it is sometimes covenanted in the lease, for the landlord to allow a certain quantity of coal to make good the deficiency of wood, the tenant finding carriage. On the Cotswolds, however, beech and other wood form a material article of fuel, being converted into billets, and sold on the spot at different prices, from 16s. to 18s. the statute cord. (See Appendix.)

Situation in regard to fuel, is a matter of much importance in selecting a place of residence; so that the expenditure of a family at Stow will nearly be in the proportion of six to one of a family near the pits; or, stating the years consumption at twenty tons, the cost to the first will be at least 35*l.* and to the last from 6*l.* to 7*l.* As nearly the whole quantity of coal used in the county, with the exception of a small portion within a reasonable distance of Evesham, on the Avon, are supplied from Gloucester, or other towns on the banks of the Severn, brought either from the counties of Stafford or Salop, or from the coal-pits within the county; the price at the respective places where it is wanted, may be ascertained by adding the expence of carriage by land or water, according to the usage of the neighbourhood. Every mile may be reckoned to add 2*s*. to the price of a ton by land, and 3*d*. by water, except on the Severn, where the difference is trifling in the whole extent between Worcester and Gloucester.

To the poor who live on the Cotswolds, the dearness and scarcity of fire-fuel is of great importance. Before the inclosure of the downs, they got a tolerable supply from the furze, which grew in abundance; but this resource is now lost, except in the few parishes where a portion of land has been allotted for the purpose, as at Condicote and Bledington. In the event of a general inclosure bill, it will deserve a serious investigation, whether a more desirable mode of assisting the poor with fuel may not be adopted, than leaving a portion of land over-run with furze, and of course unproductive.

Peat is not burnt in the county as fuel, though it is probable that, in the northern parts, some advantages might be derived from it.

CHAPTER XV.

POLITICAL ECONOMY,

AS CONNECTED WITH, OR AFFECTING AGRICULTURE.

SECT. I.—ROADS.

THE badness of the roads was for many years a great check to the industry of the farmer of this county. Without a most powerful team, he could neither convey his corn to market, or take advantage of various manures, which distant places had the means of affording. These, with a number of other inconveniences, are now in a great measure removed by the improved state of the roads. Few counties are more intersected, and few have materials more varying in quality. On the Cotswolds, the calcareous grit, or sand-stone, is found in every situation, in great abundance, and with little trouble or expence; but being of a soft nature, it decomposes by frost, and pulverizes under the pressure of even small weights, consequently requiring frequent renewal. To save the expence of carriage, this ordinary material is generally dug by the sides of the roads, and the pits left open, to the annoyance and danger of the traveller.

In the greater part of the Vale, good materials are so scarce, that it becomes a serious expence to make and keep the roads in good repair. Till within a few years, the business was done with a blue clay-stone, which is very abundant, or with hill-stone, as before-mentioned. The former has no durability for the purpose, having the bad property of slaking almost like lime, after exposure to the frost; and the latter, however it may be made to answer on the hills, where it is laid on a stratum of natural rock, cannot be used with the like advantage in the Vale: it is now indeed nearly out of use, except in places where a foundation is to be made; and here it is thrown in of large size, to prevent the superstratum of better and more costly materials from sinking in.

The stone which is now in general use, from ten miles below to a few miles above Gloucester, is a hard compact lime-stone from St. Vincent's rocks, at Clifton, or those at Chepstow. This must be understood of the roads within reach of the navigation of the Severn. This material will bear a very heavy pressure; is therefore lasting, though first laid at a great expence. At Gloucester Quay, it is landed at 5*s*. a ton; at the intermediate places below, at somewhat less, but seldom under 4*s*. The expence of carriage to the place where it is to be used, may be averaged at 2*s*. 6*d*. more, and to this must be added from 1*s*. 2*d*. to 1*s*. 6*d*. for breaking and laying; making in the whole, 8*s*. per ton, in the most advantageous situation: notwithstanding the price, it is found to answer better, in point of economy, to use this stone, charged with several miles of land-carriage, than to apply that of the country found by the road side. The roads in the neighbourhood of Berkeley are repaired with a species of iron-stone, raised near the places where it is wanted, and is a hard material, but not equal to the lime-stone in durability.

The first formation of a road with lime or Bristol stone, as it is generally called, is attended with almost a ruinous expence; but where the foundations are well laid with the stone of the country, and the exterior formed with due convexity, then covered with the hard stone, the effect is lasting: but, though the future expences be thus diminished, yet not less than 120 tons are necessary to replenish the wear of a mile every year.

In the neighbourhood of Frampton-upon-Severn, the roads are much improved by giving a good surface coat of gravel on the fresh laid materials.

The only art in applying this kind of stone, is to break it very small, and, by a moderate rounding, to leave a declivity on each side for the water to run off: deep ditches should be avoided, as unnecessary, and even dangerous; but care should be taken that there be a proper current to carry off the water that falls, into the greater ditches or brooks.

Where gravel is not to be had for covering the surface, the scrapings, when formed of lime-stone, and slightly laid on, are found to be a good substitute; for being in fact lime-stone, minutely reduced, it partakes of the nature of lime, and possesses a binding quality.

Before the introduction of this lime-stone, slag, or scoria, from the copper-works in the neighbourhood of Bristol, was much used, and tended greatly to improve the roads; and indeed has formed the permanent foundation of the present practice. This material, however, being found unpleasant for travelling, ruinous to the feet of horses, and, in case of a fall, dangerous to the horse and rider, is now out of use on the roads about Gloucester.

On the turnpike-roads scraping is much practised;

and it not only answers the purpose of keeping them clean, but also prevents the working up of the settled materials, which would be effected by the insinuating power of stagnate water. In the Forest district, the roads are much improved, and in some parts may be called good, where, but a few years since, they were all but impassable. Lime-stone is there in great plenty, and attention alone, with common understanding, are required to make travelling commodious, through this beautiful country. By an Act of 36 of Geo. III. 10,000*l.* was advanced by Government for the improvement of the Forest roads; and the tolls stand engaged for the repayment, when they shall exceed the necessary demands for repairs. By this the Treasury, which before was liable to all charges relative to the Forest roads, is discharged from all future demands. The money has been applied in making three new and convenient roads through the Forest.

SECT. II.—CANALS.

As a national concern, or in a commercial point of view, there can be but one opinion on the utility of canals: but as connected with agriculture, some doubts may be entertained. The landholder will watch with extreme jealousy any inroads made on his land, and will expect some very great advantages to be held out to induce his acquiescence: and the advantages usually held out, are of too commercial a cast to satisfy the agriculturist. The internal riches of a country are doubtless often locked up for want of easy and convenient carriage; the valuable iron and coal-mines of

Monmouthshire could not have been worked with any success, but by the assistance of a canal; and the same may be said of a variety of other cases; but, considered as connected with, or affecting agriculture alone, their advantages may be questioned. The more easy conveyance of manure to the farm, and of cyder, timber, &c. to distant places, are almost the only temptations to the farmer; but, I believe, they have in no case been sufficiently strong, to bring him over to a relinquishment of his land without complaint. The loss of land, indeed, is seldom estimated at its real value: a high price is given to satisfy the owner, while the only satisfaction made to the late occupier, whose estate perhaps is separated inconveniently into two parts, is a proportionate reduction in rent; and the failure to the public of part of its usual supplies, is not estimated, or, if it were, cannot be compensated.

The loss of land occasioned by the three canals of this county, is as follows: the Berkeley, according to its original plan, 215 acres at least; the Stroudwater, with the Thames and Severn in their passage through this county, upwards of 200; and the Hereford, more than 100; making in the whole a sum total of 515 acres lost to the purposes of agriculture, besides a considerable quantity rendered almost useless by the oozing of the water through the banks. This may be considered as a trifling deduction from the superficial extent of a county: as the question, however, with respect to population, has lately taken a new turn, and fears are entertained, lest it should be redundant, every acre of land taken from cultivation increases the supposed growing evil in an inverse ratio, by diminishing the usual funds of subsistence in the country.

The time is probably fast approaching, when the iron rail-road will supersede the further use of canals, for the conveyance of materials and commodities of all kinds, through the interior parts of the island: one horse of moderate strength will draw many tons of compact heavy substances with ease; and the frequent elevations which interrupt the level surface, may be managed with little trouble by the inclined plane, or by tunnel. The scheme is proposed to be adopted on a large scale in the Forests of Kingswood and Dean, for the purpose of conveying coals to the Avon and Severn.

Almost the only adequate compensation, which can be made for the loss of land to the farmer, is the obtaining manure, and particularly of lime: something of this kind was expected from the neighbourhood of Newent, where coal and lime-stone are in plenty; it does not, however, appear that any advantage has yet been derived from that source. In fact, no canal immediately intersects the county in either of the directions where coal and lime are cheap and plentiful; of course, these are still locked up from the farmer, except within the circuit of a few miles, at the heavy expence of land-carriage.

SECT. III. AND IV.—FAIRS AND WEEKLY MARKETS.

The most considerable markets are those of Gloucester, Cirencester, and Tewkesbury. These are well frequented, and abundantly supplied with corn, meat, poultry, and other necessaries of life.

The following List of Fairs is confined to Market-towns; those which are held in villages, are of little importance or use, being chiefly consigned to the sale of pedlary wares.

Towns.	*Market Days.*	*Fair Days.*
Berkeley	Tuesday	May 14.—Horses, cattle, and cheese.
Campden	Wednesday	Ash-Wednesday, April 23, August 5, December 11.—Horses, cattle, linen cloth, &c.
Cheltenham	Thursday	Second Thursday in April, Holy Thursday, August 5, second Thursday in September, third Thursday in December.—Horses, cattle, &c.
Cirencester	Monday & Friday	Easter-Tuesday, July 18, November 8.—Horses and cattle of all kinds.
Coleford	Friday	June 20, November 24.—Forest wool, horses, and cattle.
Dursley	Thursday	May 6, December 4.—Horses and cattle.
Fairford	Thursday	May 14, November 12.—Horses, cattle, sheep, &c.
Gloucester	Wednesday & Saturday	April 5, July 5, September 28, November 28.—Horses, cattle, sheep, and cheese.
Hampton	Tuesday	Trinity-Monday, October 29.—The same.
Lechlade	Tuesday	August 10, September 9.—The same.
Marshfield	Tuesday	May 24, October 24.—The same.
Mitcheldean	Monday	Easter-Monday, October 10 The same.

Towns.	*Market Days.*	*Fair Days.*
Newnham	Friday	June 11, October 18.—Horses and cattle.
Newent	Friday	Wednesday before Easter, Wednesday before Whitsuntide, August 12, Friday after September 8.—Horses, cattle, and sheep.
Northleach	Wednesday	Wednesday before April 23, third Wednesday in May, Wednesday before September 29.—Horses, cattle, sheep, and cheese.
Painswick	Thursday	Whit-Tuesday, September 19.—The same.
Sodbury	Thursday	May 23, June 24.—Horses and cattle.
Stow	Thursday	May 12, Oct. 24.—Horses, cattle, sheep, and linen cloth.
Stroud	Friday	May 12, August 21.—Horses and cattle.
Tetbury	Wednesday	Ash-Wednesday, and July 22.—Horses, cattle, sheep, and wool.
Tewkesbury	Wednesday & Saturday	Second Monday in March, first Wednesday in April *(O. S.)* May 14, June 22, September 4, October 10.—Cattle and cheese.
Thornbury	Saturday	Easter Monday, August 15, Monday before December 21.—The same.
Wickwar	Monday	April 5, July 2.—Horses, cattle, and sheep.
Winchcomb	Saturday	May 6, July 28.—The same.
Wotton-under-Edge	Friday	September 25.—Horses, cattle, and cheese.

SECT. V. AND VI.—MANUFACTURES AND COMMERCE.

The principal manufactures of the county, are those of woollen broad-cloths, of various sorts, but chiefly superfine, made of Spanish wool; and of fine narrow goods in the stripe and fancy way, to a very great extent. These are carried on in that district, which, by way of distinction, is called the Bottoms, including parts of the several parishes of Avening, Painswick, Pitchcomb, Randwick, Minchinhampton, Stroud, Bisley, Rodborough, Stonehouse, King's Stanley, Leonard Stanley, Woodchester, Horseley, and Eastington. Extensive works are also carried on at Dursley, Cam, Uley, Alderley, Wickwar, and Wotton-under-Edge.

The scarlet, blue, and black dyes are applied to cloths, in very high perfection, in these districts.

At Cirencester, thin stuffs, composed of worsted-yarn, which are called Chinas, are manufactured. Carpet-weaving is also carried on in a small way, and a few woollen cloths are made for the army and India Company, which are sent undyed to London. Many labouring people are employed in sorting wool from the fleece: this, however, though forming a considerable part of the trade of the town, is much decreased within the last forty years, as also spinning woollen-yarn and worsted, since the introduction of machinery.

At Tewkesbury, the stocking-frame-knitting is the principal manufacture, and finds employment for the greatest part of the lower class.

At Dursley, Stroud, and Wotton-under-Edge, wire-cards are made for the use of the clothiers.

Rugs and blankets are manufactured at Nailsworth, Dursley, and North-Nibley.

At Froombridge, in the parish of Frampton-upon-Severn, is an extensive set of works for making iron and brass-wire; and at Framilode, in the parish of Eastington, is a manufactory of tin-plate.

Brass and wire are made at Baptist's-Mills, near Bristol; at Warmley, in the parish of Bitton, and other places in that neighbourhood.

The pin-manufacture flourishes to an important extent at Gloucester; and on a smaller scale at Warmley, and other places.

Fine writing-paper is made at Gunn's-Mills, in the parish of Abbenhall; at Postlip, in the parish of Winchcomb, and at Queenington; coarser sorts, at Wick, Dursley, and Wheatenhurst.

Felt-hats are made, and principally employ the lower class, at Frampton-Cotterel, Iron-Acton, Pucklechurch, Rangeworthy, and other villages of that neighbourhood, for the Bristol trade.

Flax-spinning forms a great part of the women's business during the winter, in the upper part of the Vale of Evesham; but not to so great an extent as formerly, when flax was more grown in that district. The raw materials, chiefly raised in Worcestershire and Warwickshire, are now furnished by the linen-manufacturers of of Stratford.

At Flaxley, in the Forest district, and Lidney, are very ancient and extensive works, both for the reduction of iron-ore, and manufacturing of malleable iron. At the former place, the best iron in the kingdom is made.

At Redbrook, near Newland, and Coleford, are furnaces on a large scale for the reduction of iron-ore.

At Little-Dean, the labouring class is employed in making nails; at Lidbrook, near Ruerdean, are extensive tin-plate works; and, dispersed through the Forest, are a number of small coal-mines, and quarries of excellent stone, which employ, or might employ, such of the lower class as do not belong to the manufactories.

The articles of agricultural commerce, are cheese, bacon, cyder, perry, grain of all sorts. Salmon also find their great market in the metropolis; and, it is said, that, for salmon alone, 4000*l.* is annually remitted into the country.

Of manufacturing commerce, the vast importance of the trade in fine woollen-cloths, is well known. To these may be added, a large return from pins, great quantities of which are exported to America.

It appears from the population returns in 1800, that 40,086 persons are employed in this county, exclusive of Gloucester and Bristol, in trade, manufactures, and handicraft; being 9,334 less than those employed in agriculture.

SECT. VII.—POOR.

To make the poor at the same time industrious, frugal, and comfortable, is a most desirable object, and the endeavour to accomplish it, a duty too obvious to be mistaken. A cottage is the first comfort of a labouring man: it seems, however, that gentlemen of landed property are not sufficiently aware of this, otherwise so many miserable huts would not disgrace our villages.

Yet, at the same time, it must be allowed, that many well-designed cottages are rendered uncomfortable by the laziness and filth of their inhabitants; and there are instances, where neither good houses, good clothes, nor even good wages, will remove the misery, so much the subject of complaint. This disappointment, however, in our benevolent intentions, should not slacken our efforts: if the poor will not, by fair argument and experience, be induced to feel the value of their own comforts, they should almost be compelled to do so; but before any great improvements can be brought about in this way, the public-house should be restricted, regulated, and inspected, as enjoined by the many statutes enacted for that purpose, enforced by two proclamations of his present Majesty,* and directed by the order of the Court of Quarter Sessions.

Pawn-brokers' shops are another source of incalculable mischief: the Legislature has endeavoured to secure the borrower from extortion, but the evil has been but little relieved. The poor dare not complain, not because their complaints would be neglected by the Magistrate, but because they are at the mercy of the lender. The great evil, however, is the certainty of being able to adopt this expedient at *any* time, and therefore of not being obliged to make a provision, or reserve a portion of earnings against the day of sickness or unforeseen necessity. Every man, while he has work to do, and health and vigour to perform it, is able to make a little saving from his weekly payments; and small savings become of consequence by time, and imperceptibly rise into a relative importance; but if neither a spirit of economy or independence is to be found, if all idea of degradation be lost, the poor man will feel no compunction in spending the last sixpence in the alehouse, when he recollects, that the expedient of pawning his clothes or goods is ready at hand; or, if this has been pushed as far as it can go, of applying to the overseer for parochial relief.

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* The first proclamation was issued October 31, 1760; and the second, June 5, 1787.

Another great diminution of the comforts of the poor may be traced to the credit they obtain at the village-shop. Here every article is purchased at an exorbitant price; and it is probable, that, notwithstanding the almost general appointment of inspectors under a late Act, weights and measures are not answerable to the legal standard. The improvident poor man is also generally on the shop-keeper's book, and obliged to take what is offered him, without examination or murmur, under threat of the law. The labouring man, however well disposed, is often driven to the necessity of being in this situation, by the imprudent conduct of the farmer, in deferring the payment of his wages till Sunday morning, and sometimes even till Monday: hence arises the necessity of taking credit; and when the wages are afterwards received, other uses are found for the money, and the discharge of the shop-debt put off to a future opportunity.

In many parts of the manufacturing districts, the manner in which the poor live, is miserable in the extreme. The interior of their habitations exhibits every appearance of wretchedness and poverty. The mischief is with more facility traced to its cause, than prevented. Independent of the usual effects produced among large associations of workmen, of various tempers, ages, and degrees of depravity, much evil arises from the too common custom of paying the workmen's wages at the public-house, of all places the most improper and dangerous; since it is almost impossible for a man, however temperate in his inclinations, to resist temptation, thus powerfully offered to his appetites, and encouraged by example.

The poor are maintained at a heavy expence through the county; and it is proved (chap. 4, sect. 4,) that nearly a seventh of the rental is expended on this and other incidental circumstances, which are provided for by the poor's-rate. The late period of scarcity brought with it more ill consequences, than what merely resulted from the dearness of provisions: it obliged many to apply for parochial relief, who before felt the conscious pride of independence; and that pride having once been broken, has not yet been, nor probably ever will be recovered. No more disgrace is now attached to such applications, than as if they were for the regular earnings of industry.

In the clothing district, the weight of parochial assessments falls uncommonly heavy on landed property. During the late scarcity, the average charge might be 4*s.* 6*d.* through the county; while, at the same time, it amounted to at least three times that proportion in some of the parishes, where the clothing manufacture is carried on. It surely wears the appearance of unreasonableness and injustice, that personal property or stock should not, as the letter of the law directs, assist in relieving this heavy and oppressive charge on the landed interests.

The children of the poor are put to some kind of employment as soon as they are able to work. In the manufactories, particularly the clothing, the introduction of machinery has supplied work for very young children, though probably at the expence of health and morals in the rising generation.* It has also annihilated the means of domestic employment of women and children, not only in the adjacent villages, but through the whole agricultural district, to the extent of forty miles. The families of labourers who were used to earn a good deal towards their maintenance by spinning, have now no employment in the winter, and only a partial supply of such agricultural business as is suited to their strength in summer.

It is proper here to observe, that the agricultural and manufacturing labourers of this county, are not marked with any peculiar degree of profligacy or idleness. To both, there are doubtless several exceptions; generally speaking, however, they are at least as sober and industrious as others of the same class in other counties; nor do I conceive that many are willingly idle, in order to rest on parish relief, however true it may be, that the disgrace attached thereto has lately been very much diminished. The people are ready to work when they can find employment; and it is the want of work only, or the *apprehension of it,* which at any time makes them dissatisfied. It is their constant declaration, "give us work, and then we shall neither regard the price of provisions, nor want parochial assistance."

In some parishes, the law which is intended to oblige the occupiers of estates to take children of the poor as apprentices, is carried into effect; and perhaps no better method can be adopted for breeding them up in habits of industry, and making them useful in the occupations of husbandry. The master, having obtained a legal right to the services of his apprentice, will take care that he shall not be idle: he will, on his own account, if on no better principle, be equally careful not to make the exercise of industry injurious to his health; and if he has a proper sense of the relative situation so established, he will consider himself as intrusted with a public duty, for the faithful discharge of which he is accountable, not only to his immediate neighbourhood, but to the whole community.

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* The profligacy arising from an intercourse of the sexes in all great manufactories, is much to be lamented; but the condition of children, who are the attentive observers of the language and actions of their elders, is so bad as to require the speedy and active exertions of Parliament to amend and improve it.

Provident Societies are established in almost every large town, and in all parts of the manufacturing district; and, when founded purely and undisguisedly for temporary relief to the sick, or a more permanent provision for the aged and the widow, they are entitled to every encouragement; as the effects would probably be felt in the reduction of the poor rates, and in the gradual revival of that spirit of independence, which, as already remarked, is much lowered, if not altogether lost.

The number of members in Friendly Societies, according to the return made in 1803, was, in this county, 19,606, which is annually increasing.

Of houses of industry on the large scale, usually termed Hundred Houses, there is not one in the county. A few instances occur of a junction of parishes, under what is called Gilbert's Act; but almost as numerous as the parishes, are the work-houses for the indiscriminate reception of those, who, either by age, misfortune, or misconduct, are reduced to become chargeable to the parish. Some of these, it is observed with regret, are still farmed by keepers, who find food, clothing, and fuel, by contract, at so much by the head. By such institutions, the parish rates may possibly be reduced, but that is all that can be said in their favour: they are otherwise fraught with mischief, moral and political.

The truth is, that, previous to the late modification of the Act of 9 G. I. by the Act of the 36 G. III. these work-houses were erected, more with the view of exciting terror, than providing for the comforts of the poor; their comforts, indeed, must be a very remote consideration, when they are let to the lowest bidder. In a civilized nation, it is a circumstance degrading to human nature, to hold up the poor by public advertisement, as an object of speculation to the inhuman and covetous. He who farms them, can have no inducement to take the burthen upon him but profit; and at whose expence, and by whose sufferings, this profit is to be secured, may easily be conjectured. Fortunately, the intended purpose of these buildings has been in a great measure frustrated, by the interference of the Legislature, in the Act above mentioned.

The Legislature has, in the present year (1805), made a farther progress towards correcting the abuses of work-houses, by enjoining the residence of the contractors within the parish or place where the workhouse is erected, and obliging them, by their own, and the bond of one or more responsible persons, to the amount of half the yearly assessment, to the true and faithful performance of the contract.

Where, however, gentlemen of liberal principles, and enlarged views of society, overlook and regulate these institutions, the two objects of pecuniary* and moral good, are capable of being combined; and the invidious terms of Work and Poor-houses exchanged for the more pleasing ones, of Houses of Industry, Comfort, and Virtue.

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* Mr. Rose, in his Observations on the Poor Laws, (page 35,) seems to be of opinion, that the object of pecuniary good, is seldom attainable on the work-house system: he observes, "that a heavier expence is frequently incurred for their maintenance, than the allowance which the unfortunate creatures would be content

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to receive at home;" and in support of this assertion, says, "that paupers in work-houses cost about 12*l.* 3*s.* 6¼*d.* each annually, throughout England, and other parishioners relieved out of work-houses about 3*l.* 3*s.* 7½*d.*" This, however, I conceive not to be a fair inference from the parochial returns. The poor which are relieved out of work-houses, in places where work-houses are established, are in general those, who, from the largeness of family, scarcity of work, or unusual price of provisions, are unable to maintain themselves and children wholly, without a partial supply from the parochial funds: were these to be sent into the work-house, it is possible that their individual comforts might be lessened, though the public expence would be but little, if at all increased, because their earnings would go in the same ratio in the house, as out of the house, towards their maintenance: but, in truth, those who are sent to work-houses, either cannot work, from disability occasioned by sickness or age, or are infants not yet old enough to work; or have been driven, under the cruel operation of the settlement law, from places, where work was to be had, which they could do, to their own parishes, where work only of that description was to be had, which they were not accustomed to do. Work-houses are, according to Mr. Rose's own description, places of retreat for such of the aged, the infirm, or infant poor, who are so utterly friendless as to have no relations, or other persons, who will take care of them. The young, the healthy, and robust, will not come into the work-house at all.

SECT. VIII.—POPULATION.

If, according to Dr. Paley, the decay of population is the greatest evil which a state can suffer, and the improvement of it, the object which ought in all countries to be aimed at in preference to every other political purpose whatever, the following Table will afford pleasure, as it shews, that, while the whole nation has increased in its general population, this county has at least kept pace with others; that in many parishes an addition of more than half has been made to the number, as it stood at the beginning of the last century; and wherever there happens to have been a decrease, good reasons may be assigned for it. The most material instances of decrease, are observable in some market-towns, as Dursley, Northleach, Wotton-under-Edge, &c.; and the reason is, that the manufacture of cloth is more or less removed to the neighbouring places, where there was a more ample supply of water, or less confined room for the increased buildings which are now become necessary, since the extensive introduction of machinery.

For an explanation of the Tables, see the end of them.

Hundreds and Parishes.	*Quantity of Acres.*		*Population at three Periods*			*In-crease.*	*De-crease.*
	Tythable	*NotTyth*	1700.	1770.	1801.		
Berkeley Hundred.							
LOWER PART.							
Almondsbury	6,000	—	530	530	1,002	472	
Elberton	1,500	—	104	122	179	75	
Filton	1,060	—	80	125	115	35	
Hill	1,600	—	200	146	220	20	
Horfield	1,100	—	100	125	119	19	
UPPER PART.							
Arlingham	—	2,100	400	372	506	106	
Ashelworth	—	1,560	350	350	476	126	
Berkeley	9,300	—	2,500	1,854	3,090	590	
Beverston	—	2,000	164	144	150	—	14
Cam	3,330	—	800	1,070	1,285	485	
Coaley	2,280	—	500	598	800	300	
Cromhall	2,800	—	360	316	550	190	
Dursley	2,000	—	2,500	2,000	2,379	—	121
Kingscote	—	1,200	250	497	271	21	
Newington Bagpath	1,600	—	220	354	217	—	3
Nibley North	3,000	—	1,000	1,700	1,211	211	
Nimpsfield	1,130	—	250	497	523	273	
Olepen	1,100	—	140	196	188	48	
Ozleworth	1,222	—	70	80	133	63	
Slimbridge	—	4,000	560	800	770	210	
Stinchcomb	1,203	—	500	450	419	—	81
Stone	700	—	200	200	242	42	
Uley	2,500	—	900	1,310	1,724	824	
Wotton-under-Edge	3,500	—	3,500	4,000	3,393	—	107
	46,980	10,860	16,173	17,836	19,962	4,110	326
Bisley Hundred.							
Bisley	6,000	—	3,200	4,905	4,227	1,027	
Edgeworth	1,300	—	120	106	116	—	4
Miserden	2,100	—	250	477	469	219	
Painswick	4,500	—	2,120	3,300	3,150	1,030	
Saperton	300	950	320	300	351	31	
Stroud	2,182	—	3,000	4,000	5,422	2,422	
Winston	—	1,120	100	160	143	43	
	16,382	2,070	9,110	13,248	13,878	4,772	4
Bradley Hundred.							
Aston Blank	500	2,000	120	171	216	96	
Coln Rogers	1,500	—	70	125	110	40	
Compton Abdale	1,800	—	130	130	157	27	
Dowdeswell	1,600	—	120	199	196	76	
Farmington	—	1,600	100	195	216	116	
Hampnet	2,160	—	60	78	90	30	
Hazleton&Yanworth	—	1,500	100	161	195	95	
Northleach	—	3,600	900	683	814	—	86
Notgrove	—	2,000	150	218	214	64	

Hundreds and Parishes.	Quantity of Acres.		Population at three Periods			Increase.	Decrease.
	Tythable	Not Tyth	1700.	1770.	1801.		
Salperton	—	1,350	60	155	186	126	
Sevenhampton	3,000	—	180	288	349	169	
Shipton Oliffe and Solers	—	2,600	200	243	239	39	
Stowell	800	—	13	13	13	—	
Turkdean	—	2,000	120	113	143	23	
Whittington	300	700	126	126	194	68	
Withington	4,000	—	320	500	572	252	
	15,660	17,350	2,769	3,398	3,904	1,221	86
Brightwell's Barrow Hundred.							
Aldsworth	—	3,200	120	120	288	168	
Barnesley	2,000	—	160	217	271	111	
Bibury	1,000	850	500	780	852	352	
Coln St. Aldwyns	—	2,364	300	392	385	85	
Eastlech Martin	—	1,700	120	313	210	90	
Eastlech Turville	—	2,500	200	400	370	170	
Fairford	3,427	—	660	1,200	1,326	666	
Hatherop	—	1,882	150	204	247	97	
Kempsford	—	4,821	340	493	656	316	
Leachlade	3,122	—	500	925	917	417	
Quenington	—	1,733	120	267	239	119	
Southrop	1,409	—	170	206	238	68	
	10,958	19,050	3,340	5,517	5,999	2,659	
Cheltenham Hundred.							
Charlton King's	3,000	—	550	458	730	180	
Cheltenham	—	2,200	1,500	1,433	3,076	1,576	
Leckhampton	—	1,400	120	142	225	105	
Swindon	1,000	—	90	105	116	26	
	4,000	3,600	2,260	2,138	4,147	1,887	
Cleeve Hundred.							
Cleeve	8,000	2,000	875	1,252	1,355	480	
Crowthorn and Minety Hundred, including Cirencester.							
Amney Crucis	—	4,000	350	357	514	164	
Amney St. Peter	300	300	100	105	162	62	
Amney St. Mary	—	1,100	80	118	167	87	
Amney Down	2,300	—	180	148	279	99	
Bagendon	1,100	—	60	139	133	73	
Baunton	—	1,300	70	56	108	38	
Cirencester	4,000	—	4,000	3,878	4,130	130	
Cerney, South	3,000	—	500	806	798	298	
Cotes	—	2,585	120	220	226	106	

Hundreds and Parishes.	Quantity of Acres.		Population at three Periods			In-crease.	De-crease.
	Tythabl	NotTyth	1700.	1770.	1801.		
Daglingworth	1,410	—	138	184	215	77	
Driffield	—	1,500	120	137	128	8	
Duntsborne Abbotts	200	900	180	176	245	65	
Duntsborne Rouse	1,800	—	60	72	93	33	
Harnhill	700	—	80	89	71	—	9
Meysey Hampton	—	2,000	260	265	315	55	
Minety	3,628	—	480	480	479	—	1
Preston	—	1,400	70	171	141	71	
SiddingtonSt.Mary SiddingtonSt.Peter	—	2,100	153	153	325	172	
Stratton	—	1,312	150	173	166	16	
	18,438	18,497	7,151	7,727	8,695	1,554	10
Deerhurst Hundred.							
LOWER PART.							
Deerhurst	3,000	—	620	530	646	26	
Lye	1,500	—	160	245	303	143	
Prestbury	3,000	—	445	500	485	40	
Staverton	—	900	200	120	159	—	41
Wollastone	800	—	90	100	83	—	7
UPPER PART.							
Coln Dennis	1,500	—	80	112	163	83	
Compton Parva	—	1,570	180	242	296	116	
Preston-upon-Stour	—	1,087	200	200	267	67	
Welford	—	2,000	450	440	516	66	
	9,800	5,557	2,125	2,489	2,918	541	48
Dudstone and King's Barton Hundred.							
LOWER PART.							
Hartpury	3,036	—	300	300	567	267	
Lassington	500	—	45	33	85	40	
Maisemore	—	1,408	200	210	343	143	
Preston	826	—	60	70	87	27	
MIDDLE PART.							
Barton Hamlets	—	660	697	697	697		
Brockthrop	1,070	—	200	107	112	—	88
Elmore	1,200	—	300	300	381	81	
Harescomb	750	—	60	74	108	48	
Hempstead	1,200	—	140	129	159	19	
Matson	—	800	50	45	51	1	
Pitchcomb	300	—	80	90	216	136	
South Hamlets	—	1,400	240	240	322	82	
Upton St. Leonard's	3,000	—	450	300	621	171	
Whaddon	1,600	—	110	123	88	—	22
UPPER PART.							
Badgworth	3,140	—	360	500	603	243	
Barnwood	1,400	—	180	220	309	129	
Brockworth	1,600	—	200	253	350	150	
Church Down	3,300	—	400	630	644	244	

Hundreds and Parishes.	*Quantity of Acres*		*Population at three Periods*			*Increase.*	*Decrease.*
	Tythable	*Not Tyth*	1700.	1770.	1801.		
Down Hatherley	1,000	—	100	100	119	19	
North Hamlets	—	1,289	520	520	520	—	
Norton	—	1,400	300	240	303	3	
Sandhurst	2,000	—	300	260	365	65	
Shurdington Great	800	—	70	80	85	15	
Whitcomb Great	800	—	90	96	119	29	
	26,922	6,957	5,452	5,617	7,254	1,912	110
Grumbald's Ash Hundred.							
Acton Turville	700	—	80	90	156	76	
Alderley	1,000	—	120	157	212	92	
Badminton Great	2,000	—	176	300	518	342	
Boxwell with Leighterton	2,039	—	104	175	217	113	
Charfield	1,800	—	145	200	247	102	
Didmarton	700	—	56	72	74	18	
Doddington	1,400	—	56	98	95	39	
Dirham and Hinton	2,400	—	280	350	437	157	
Hawkesbury	6,400	—	598	896	1,301	703	
Horton	2,600	—	120	332	366	246	
Littleton West	800	—	44	67	100	56	
Oldbury-on-the-Hill	1,600	—	80	232	239	159	
Sodbury, Chipping	100	—	650	800	1,090	440	
Sodbury, Little	900	—	90	115	89	—	1
Sodbury, Old	3,000	—	200	200	687	487	
Tormarton	2,400	—	130	207	225	95	
Wapley, Codrington	2,000	—	180	200	258	78	
Tortworth	2,000	—	240	241	269	29	
Wickwar	2,500	—	1,000	850	764	—	236
	36,339	—	4,349	5,582	7,344	3,232	237
Henbury Hundred.							
Compton Greenfield	500	—	20	37	24	4	
Henbury	10,500	—	880	1,200	1,537	657	
Stoke Gifford	2,000	—	200	283	281	81	
Westbury-upon-Trim	5,000	—	650	900	2,325	1,675	
Yate	4,500	—	320	412	654	334	
	22,500	—	2,070	2,832	4,821	2,751	
Kiftsgate Hundred.							
LOWER PART.							
Aston Somerfield	—	1,000	60	51	87	27	
Buckland	—	1,160	250	316	328	78	
Charlton Abbotts	—	1,500	60	63	100	40	
Child's Wickham	300	1,100	340	340	351	11	
Didbrooke	1,060	400	100	85	254	154	
Dumbleton	—	1,900	200	200	307	107	
Guiting Lower	600	2,000	300	375	430	130	
Guiting Temple	—	5,500	191	428	301	110	

Hundreds and Parishes.	*Quantity of Acres.*		*Population at three Periods.*			*In-crease.*	*De-crease.*
	Tythable	*Not Tyth.*	1700.	1770.	1801.		
Halling	—	1,600	100	132	192	92	
Hayles	—	1,500	80	90	111	31	
Pinnock	1,500	—	24	25	125	101	
Rowel	—	800	41	41	41		
Snowshill	300	1,800	192	236	263	71	
Staunton	500	2,000	301	310	256	—	45
Sudeley	—	1,800	90	25	68	—	22
Toddington	1,300	—	200	186	312	112	
Twining	3,308	—	600	567	752	152	
Winchcomb	2,465	3,000	2,715	1,960	1,888	—	827
Wormington	800	—	80	86	91	11	
UPPER PART.							
Ashton Subedge	—	625	104	63	116	12	
Battsford	930	—	80	87	89	9	
Chipping Campden	—	4,600	1,618	2,000	1,700	82	
Condicote	—	1,500	80	105	115	35	
Cow-Honeybourne	—	1,225	156	160	274	118	
Dorsington	—	800	100	90	100		
Ebrington	2,500	—	341	469	464	123	
Larkstoke	—	500	12	12	12		
Longborough	—	3,027	400	389	473	73	
Marston Sicca	—	1,500	190	199	242	52	
Mickleton	2,760	300	375	251	489	114	
Pebworth	—	2,915	400	436	579	179	
Quinton	—	3,000	500	547	485	—	15
Saintbury	1,300	—	240	135	152	—	88
Seasoncote	—	1,400	30	43	44	14	
Swell, Upper	—	1,100	82	69	74	—	8
Weston Subedge	2,400	—	300	197	332	32	
Weston-upon-Avon	—	2,500	60	70	118	58	
Willersey	—	1,500	250	250	273	23	
	22,023	53,552	11,242	11,068	12,388	2,151	1,005
Langley and Swineshead Hundred.							
Alvestone	3,000	—	240	198	412	172	
Bitton	5,532	—	1,150	4,634	4,992	3,842	
Doynton	1,200	—	200	340	303	103	
Frampton Cotterel	2,000	—	300	393	1,203	908	
Littleton-upon-Severn	—	1,000	80	84	136	56	
Olvestone	4,300	—	240	538	1,117	877	
Rockhampton	1,400	—	120	122	160	40	
Winterbourne	4,000	—	500	567	1,592	1,092	
	21,432	1,000	2,830	6,926	9,920	7,090	
Longtree Hundred.							
Avening	3,000	—	600	600	1,507	907	
Cherington	—	1,840	120	159	173	53	
Horsley	4,000	—	1,200	1,200	2,971	1,771	

Hundreds and Parishes.	*Quantity of Acres.*		*Population at three Periods.*			*Increase.*	*Decrease.*
	Tythable	*Not Tyth*	1700.	1770.	1801.		
Minchinhampton	3,000	—	1,800	4,000	3,419	1,619	
Lasborough	—	800	15	15	15	—	
Rodborough	1,200	—	750	1,481	1,658	908	
Rodmarton	—	2,530	180	241	305	125	
Shipton Moyne	1,169	1,500	250	234	273	23	
Tetbury	4,000	—	1,200	3,500	2,500	1,300	
Weston Birt	300	850	80	106	157	77	
Woodchester	1,600	—	460	792	870	410	
	18,269	7,520	6,655	12,328	13,848	7,193	
Pucklechurch Hundred.							
Cold Ashton	2,016	—	142	213	224	82	
Pucklechurch	1,400	—	250	460	542	292	
Siston	1,800	—	450	450	856	406	
Westerleigh	4,100	—	400	930	1,582	1,182	
Wick and Abson	3,600	—	230	400	571	341	
	12,916	—	1,472	2,453	3,775	2,303	
Rapsgate Hundred.							
Brimpsfield	2,487	—	200	283	299	99	
Cerney, North	3,370	—	190	384	565	375	
Chedworth	2,000	—	500	787	848	348	
Colesbourne	2,148	—	120	254	231	111	
Cowley	1,700	—	160	268	251	91	
Cranham	1,200	—	170	170	250	80	
Cubberley	3,133	—	80	178	161	81	
Elkstone	2,230	—	160	178	299	139	
Rendcombe	2,200	—	120	139	147	27	
Syde	600	—	70	47	41	—	29
	21,068	—	1,770	2,688	3,092	1,351	29
Slaughter Hundred.							
LOWER PART.							
Barrington, Great	1,300	—	120	393	348	228	
Barrington, Little	—	1,300	82	124	140	58	
Bourton-on-the-Water	—	2,400	350	500	697	347	
Clapton	—	1,100	80	112	103	23	
Naunton	500	2,000	140	288	433	293	
Risington, Great	1,500	—	277	252	349	72	
Risington, Little	—	1,200	170	176	227	57	
Risington, Wick	—	1,600	120	182	217	97	
Sherbourne	—	3,000	300	360	526	226	
Slaughter, Upper	—	1,200	150	178	253	103	
Widford	—	480	36	20	40	4	
Slaughter, Lower	—	1,000	150	194	196	48	
Windrush	—	1,800	140	190	317	177	
UPPER PART.							
Addlestrop	—	1,150	200	200	225	25	

Hundreds and Parishes	Quantity of Acres. Tythable	Quantity of Acres. Not Tyth	Population at three Periods 1700.	1770.	1801.	Increase.	Decrease.
Bledington	—	1,343	260	251	282	22	
Broadwell	—	1,751	126	245	239	113	
Iccomb	—	600	15	15	15		
Eyford	—	1,000	25	25	57	32	
Oddington	200	920	250	338	421	171	
Stow	—	4,000	1,300	1,180	1,471	171	
Swell, Lower	—	2,283	160	213	239	79	
Westcote	1,200	—	160	120	127	—	33
	4,700	30,127	4,611	5,556	6,924	2,346	33
Tewkesbury Hundred.							
LOWER PART.							
Ashchurch, or Ashton-upon Carant	2,020	1,130	308	436	558	250	
Boddington	—	1,500	180	95	273	93	
Forthampton	2,000	—	160	208	449	289	
Kemmerton	—	1,530	150	225	427	277	
Oxenton	—	1,000	120	130	150	30	
Tewkesbury	2,246	—	2,500	3,000	4,199	1,699	
Treddington	—	800	100	169	121	21	
Walton Cardiffe	600	—	56	30	62	6	
UPPER PART.							
Alderton	1,650	—	170	172	222	52	
Bourton-on-Hill	2,960	—	250	269	369	119	
Clifford Chambers	300	998	320	212	223	—	97
Lemmington	—	836	36	59	61	25	
Prestcote	—	200	50	31	33	—	17
Shennington	—	1,500	280	300	300	20	
Stanway	4,320	—	340	260	342	2	
Washbourn, Great	800	—	60	60	89	29	
	16,896	9,494	5,080	5,693	7,878	2,912	114
Thornbury Hundred.							
LOWER PART.							
Acton, Iron	2,000	—	240	460	860	620	
Rangeworthy	800	—	150	120	230	80	
Thornbury	7,200	—	1,100	1,971	2,462	1,362	
Titherington	1,600	—	320	310	368	48	
UPPER PART.							
Marshfield	5,000	—	800	1,237	1,246	446	
	16,600	—	2,610	4,098	5,166	2,556	
Tibbaldstone Hundred							
Ashton-under-Hill	—	1,300	200	200	305	105	
Beckford	—	1,740	250	403	459	209	
Hinton-on-the-Green	2,211	—	100	105	196	96	
	2,211	3,040	550	708	960	410	

Hundreds and Parishes	Quantity of Acres.		Population at three Periods			In-crease.	De-crease.
	Tythable	Not Tyth	1700.	1770.	1801.		
Westminster Hundred.							
LOWER PART.							
Corse	—	2,050	300	253	335	35	
Elmstone-Hardwick	1,600	—	150	144	330	180	
Hasfield	—	1,550	200	175	187	—	13
Tirley	—	1,891	300	280	365	65	
UPPER PART.							
Moreton-in-Marsh	600	—	526	579	829	303	
Sutton (under Brayles)	—	1,000	130	150	208	78	
Toddingham	1,300	1,300	160	450	339	179	
	3,500	7,791	1,766	2,031	2,593	840	13
Whitstone Hundred.							
LOWER PART.							
Eastington	2,600	—	450	767	988	538	
Frampton-upon-Severn	2,300	—	500	600	860	360	
Frocester	1,300	—	250	262	362	112	
King Stanley	1,500	—	1,100	1,257	1,434	334	
Leonard Stanley	1,100	—	400	512	590	190	
Stonehouse	1,800	—	500	759	1,412	912	
Wheatenhurst, or Whitminster	1,500	—	200	231	287	87	
UPPER PART.							
Fretherne	800	—	125	96	117	—	8
Hardwick	1,647	—	280	250	341	61	
Haresfield	2,000	—	500	500	553	53	
Longney	1,200	—	260	217	314	54	
Moreton Valence	1,620	—	150	169	265	115	
Quedgeley	1,500	—	170	166	200	30	
Randwick	500	—	400	650	856	456	
Saul	500	—	130	151	349	219	
Standish	2,200	300	500	400	504	4	
	24,067	300	5,915	6,987	9,432	3,525	8
Botloe Hundred.							
Bromsberrow	1,300	—	80	138	235	155	
Dymock	5,000	1,000	1,000	1,116	1,223	223	
Kempley	900	—	180	257	218	38	
Newent	5,000	—	1,100	1,560	2,354	1,254	
Oxenhall	801	—	200	202	313	113	
Pauntley	1,000	—	115	87	215	100	
Rudford	1,050	—	106	106	165	59	
Taynton	1,800	—	200	250	378	178	
Upleaden	1,000	—	100	80	160	60	
	17,851	1,000	3,081	3,796	5,261	2,180	

Hundreds and Parishes.	*Quantity of Acres*		*Population at three Periods*			*In-crease.*	*De-crease.*
	Tythable	*NotTyth*	1700.	1770.	1801.		
Bledisloe Hundred.							
Alvington	4,000	—	700	755	952	252	
Awre, with Blakeney	900	900	200	200	211	11	
Lidney	4,710	—	700	661	1,032	332	
	9,610	900	1,600	1,616	2,195	595	
St. Briavell's Hund.							
Abbinghall	800	—	88	158	185	97	
Bicknor English	1,600	—	300	800	465	165	
Dean, Little	700	—	320	423	541	221	
Dean, Michel	500	—	600	590	563	—	37
Flaxley	—	1,000	200	196	135	—	65
Hewelsfield	1,200	—	200	253	298	98	
Lea	300	—	80	96	75	—	5
Newland, with Coleford	10,000	—	2,000	2,000	2,692	692	
Ruardeane	800	—	500	758	845	345	
St. Briavell's	4,000	—	400	766	670	270	
Stanton	1,500	—	220	220	159	—	61
Forest Lands	—	23,887	48	48	3,325	3,277	
	21,400	24,887	4,956	6,308	9,953	5,165	168
Dutchy of Lancaster.							
Bulley	800	—	85	51	176	91	
Huntley	1,600	—	242	269	313	71	
Longhope	2,000	—	500	470	636	136	
Minsterworth	2,100	400	300	300	354	54	
Tibberton	1,337	—	150	230	254	104	
	7,837	400	1,277	1,320	1,733	456	
Westbury Hundred.							
Blaisdon	1,200	—	180	137	152	—	28
Churcham	800	2,120	340	309	529	189	
Newnham	900	—	400	400	821	421	
Tiddenham	5,000	—	600	500	696	96	
Westbury-on-Severn	7,300	700	1,200	1,300	1,651	451	
Woollaston	3,000	—	400	459	613	213	
	18,200	2,820	3,120	3,105	4,462	1,370	28
Barton Regis Hund.							
Clifton	981	—	450	1,367	4,457	4,007	
Mangotsfield	—	3,000	750	2,000	2,492	1,742	
St. George's	3,500	—	3,435	3,938	4,038	603	
St. James, out Parish	500	—	500	500	1,897	1,397	
St. Philip & Jacob, do.	1,600	—	3,000	3,000	8,406	5,406	
Stapleton	2,000	—	700	1,280	1,541	841	
	8,584	3,000	8,835	12,085	22,831	13,996	
Gloucester City	20	297	4,992	5,291	7,579	2,587	

SUMMARY.

Hundreds.	Quantity of Acres. Tythable.	Not Tyth.	Population at three Periods, 1700.	1770.	1801.	Increase.	Decrease.
Berkeley	46,980	10,860	16,178	17,836	19,962	4,110	326
Bisley	16,382	2,070	9,110	13,248	13,878	4,772	4
Bradley	15,660	17,350	2,769	3,398	3,904	1,221	86
Brightwell Barrow	10,958	19,050	3,340	5,517	5,999	2,659	
Cheltenham	4,000	3,600	2,260	2,138	4,147	1,887	
Cleeve	8,000	2,000	875	1,252	1,355	480	
Crowthorne & Minety	18,438	18,497	7,151	7,727	8,695	1,554	10
Deerhurst	9,800	5,557	2,425	2,439	2,918	541	48
Dudstone and King's Barton	26,922	6,957	5,452	5,617	7,254	1,912	110
Grumbald's Ash	36,339	—	4,349	5,582	7,344	3,232	237
Henbury	22,500	—	2,070	2,832	4,821	2,751	
Kiftsgate	22,023	53,552	11,242	11,068	12,388	2,151	1,005
Langley and Swineshead	21,452	1,000	2,830	6,926	9,920	7,090	
Longtree	18,269	7,520	6,655	12,328	13,848	7,193	
Pucklechurch	12,916	—	1,472	2,453	3,775	2,303	
Rapsgate	21,068	—	1,770	2,688	3,092	1,351	29
Slaughter	4,700	30,127	4,611	5,556	6,924	2,346	33
Tewkesbury	16,896	9,494	5,080	5,693	7,878	2,912	114
Thornbury	16,600	—	2,610	4,098	5,166	2,556	
Tibbaldstone	2,211	3,010	550	708	960	410	
Westminster	3,500	7,791	1,766	2,031	2,593	840	13
Whitstone	24,067	300	5,915	6,987	9,432	3,525	8
Botloe	17,851	1,000	3,081	3,796	5,261	2,180	
Bledisloe	9,610	900	1,600	1,616	2,195	595	
St. Briavell's	21,400	24,887	4,956	6,308	9,953	5,165	168
Dutchy Lancaster	7,837	400	1,277	1,320	1,738	456	
Westbury	13,200	2,820	3,120	3,105	4,462	1,370	23
Barton Regis	8,584	3,000	8,835	12,085	22,831	13,996	
Gloucester City	20	297	4,992	5,291	7,579	2,587	
	463,183	232,069	128,341	161,693	210,267	84,145	2,219

The Sum Total of the Population of the County, &c. as appears from the Parliamentary Returns, is 250,809; and the difference between that and the result of these Tables, is accounted for as follows:

Total Population 250,809

Population of Stone ...... 212 { Omitted in the Returns, and inserted in the above Tables.

Ditto of Iccomb Hamlet .. 15 Ditto.

Ditto of Lasborough ...... 15 Ditto.

251,081

Population of City of Bristol 40,814 { Given in the Returns, but omitted in the above Tables, as not in the County.

210,267 The result of the Tables.

Explanation of the Tables.

To avoid the necessity of again enumerating the parishes, it seems not improper to have introduced into the foregoing Tables the number of acres each respectively contains, distinguishing those which are tythable or otherwise; by which may be seen what progress has been made towards the commutation of tythes, and how much remains to be done.

The first column contains the names of parishes and places; the second and third, the number of tythable and untythable acres; the fourth, the state of population at the beginning of the last century, on the authority of Atkyns; the fifth, a similar statement, from Rudder's History of the County, near the middle of the century; the sixth, the present population, as taken from the abstract of returns made in 1800, by order of Parliament, and printed by command of his Majesty; the seventh, the increase, and the eighth, the decrease, during the century.

It appears, that the county contains 695,252 acres; of which, 463,183 are still subject to tythes, and 232,069 have been exonerated by Acts of Parliament, &c.

The quantity of acres is taken either from admeasurement, which, in some inclosures, was to be obtained; or from conjectural information, which is supposed to be near the truth: rivers, however, and roads, which may be stated at 10,000 acres, are not taken into the calculation.

The population of the county and city, was, at the beginning of the last century, 128,341; had increased to 161,693 near the middle of it, and is now 210,267. After deducting 2,219 for a few instances of decrease, the actual increase during that period is 84,145.

CHAPTER XVI.

OBSTACLES TO IMPROVEMENTS,

INCLUDING GENERAL OBSERVATIONS ON AGRICULTURAL LEGISLATION AND POLICE.

FIRST. The tything system is considered by almost all writers as peculiarly inimical to agricultural improvements: that my opinion does not go to the full extent of that of others who have thought on the subject, is evident from chap. 4. sect. 3.: it goes, however, far enough to induce me to wish that a practice, which may even be supposed to operate as a check to the exertions of an enterprizing farmer, might be removed; and it is apprehended, that few holders of tythes will feel reluctance in commuting them, upon the principles which have governed the late parochial acts of inclosure. To them, I propose no amendment, farther than what I have offered before. That a general bill to facilitate inclosure, and its natural concomitant, a commutation of tythes, would produce effects highly beneficial to all parties, can hardly be questioned; and should a measure of this kind be adopted, and care taken by it to contract the expences within as narrow limits as the due execution of the business will allow, it is probable, that in a very few years the greater part of the waste-lands in this county, or even the kingdom, will be brought into cultivation.

It is frequently suggested, that inclosures of common fields favour the conversion of arable lands to pasture;

and to obviate this suspected evil, it has been proposed to introduce a clause to limit the cultivator to definite proportions of each, according to the nature and extent of his occupation. This would probably do more harm than good, and would be only removing one obstacle, to supply the place with another. Restraints on the freedom of agriculture, are injurious, and adverse to the spirit of improvement: if the farmer is left to himself (under a general caution, however, that he shall not injure the estate), he will raise those articles which are most wanted in the market; and such an equilibrium will be preserved, that, according to the proverb, the horn and the corn shall bear a due proportion to each other.

Upon similar principles, the restraints imposed upon tenants in the management of many uninclosed fields, are adverse to improvement. This is particularly applicable to some occupations in the Vale, where the rotation is fallow, wheat, beans. Under good husbandry, fallows are supposed to be not necessary at all; certainly not so frequent as in some parts of the Vale. One object of the fallow, is to clean the land; and the farmer, looking forward, as a matter of course, to the operations of a whole year for that purpose, makes no extraordinary efforts at any other time: it has, however, been proved by fact, that in some open fields, and more often in inclosed ones, even on the stiffest clays, the couch-grass and other weeds may be kept under by the adoption of a better course of crops, and the lands themselves improved by a more scientific mode of cultivation. Supposing the land to be thoroughly cleaned, and brought into a state of good tilth on the first fallow year, the following course might be pursued with advantage.

Manure on the fallow, wheat, beans, barley, or oats, with seeds, clover mowed or fed the first year, fed the second, ploughed and planted with potatoes, wheat, and beans, or peas, before the fallow. This management is practicable on stiff clays: where the land, however, inclines to sand, a crop of turnips might precede barley on the fallow, and then the rotation would be, fallow manured; turnips sown in June, or July; barley, with seeds, managed as before; wheat on the clover-ley; beans; potatoes, with some manure on the bean-stub, pared and burnt; wheat again, beans, or peas; oats before the fallow. The first is a series of nine years, and gains two clear crops; the second takes in ten years, and has the advantage of ten crops. It is conceived that there would be full time for cleaning the land early enough for turnips, on the fallow, by first ploughing immediately after the crop is off in autumn, instead of the spring; or if the business of wheat-sowing on other parts of the estate should interfere, breast-ploughing might be a substitute: regular ploughing, however, would be more beneficial, as the ridges, having been thrown down for the preceding crop, the land would now be gathered up, which would lay it dry for the winter, and open also to receive the mellowing effects of frost, and exposure. Other crops, such as cabbage, cole, &c. might be introduced, to suit the farmer's convenience and stock; and on the fallow year, if the land should not be cleaned time enough for turnips, winter-vetches, a more useful crop perhaps in the Vale, might supply their place.

The want of under-ground drains is a great obstacle to improvement; but to remove it, the co-operation of the landlord is necessary; as it is hardly to be expected that a tenant at will, or for a short term, will incur a considerable expence, to produce a permanent effect on the land he occupies. With the grant of a lease for twenty-one years, it would be well worth his while, immediately to underground-drain his wet lands, the advantages being so quick and great, that he would be sure of an ample recompense. There are few lands in this county, but what are capable of being drained; and the expence being so much reduced by ploughs and other implements, it may reasonably be expected, that, in a few years, every acre of land will be dry and healthy. See Conclusion, where a plan of improvement in this particular is suggested.

Timber being confessedly in a state of progressive diminution, (in this county at least,) it is an object well worthy the attention of the Legislature, to endeavour to secure a proper supply of that necessary article. Might not each owner of land be obliged to satisfy the overseer or constable of the hamlet or district, that, when he is cutting down a timber-tree, he is also supplying the loss, by planting, preserving, and raising a young one of the same kind, on some part of his estate? So that a yearly return might be made to the Quarter Sessions, and filed among the records of the county. If the general principle were adopted, provisoes and exceptions might be introduced, to meet many cases, where the complete adoption of the plan might be improper, or even stand in the way of improvement. This measure is suggested with the hope, that another less exceptionable may be substituted in its room, or engrafted upon it; for, that some measure is expedient, cannot be questioned. The destruction of timber, owing to its high price, holds out an irresistible temptation to cut down, while the great expences attached to landed property operate as a check upon planting: for, with the exception of a few public spirited gentlemen, plantations are scarce; but the notices for sale of timber are to be found, at the proper season of the year, in every provincial newspaper.

The Vale of this county, it is true, abounds with young growing elms in every hedge-row; but for this, no thanks are due to the proprietor: it fortunately happens, that not only the stools of the trees which are cut down, but the roots themselves, which spread to a great distance, throw out new shoots in abundance, more than enough to replenish the loss; and, for the purpose of making good trees in a few years, it is only necessary to watch their growth, and prevent them from being destroyed by cattle, or stunted by numbers. The timber thus produced, is sometimes unsound, and particularly so, if the trees are permitted to grow too long after they come to a proper size for felling; but as the demand is urgent, and the sale certain, they seldom stand too long; and in this case, the timber is good for the several purposes to which this sort is usually applied.

But the great complaint is in the continual diminution of oak-trees: these require to be raised from the acorn, or transplanted and protected; for though they will re-produce themselves in the same way as elms, yet, growing slowly, the young shoots, or plants, seldom rise above the hedge-rows, so as to become trees, or if they do, are galled, knotty, and stunted. Besides, the little probability of any advantage in the life-time of the planter, from oak-trees, is another obstacle to the plantation of them; and therefore the Agricultural Societies have, with great judgment, and considerable success, promoted this valuable branch of husbandry, by honorary and pecuniary encouragements.

CHAPTER XVII.

MISCELLANEOUS OBSERVATIONS.

SECT. I.—AGRICULTURAL SOCIETIES.

NO Agricultural Society has been established within the county, but considerable benefit is derived from that at Bath. It is, indeed, so near the borders of Gloucestershire, and so many gentlemen of the county are members of it, that it may almost be considered as a Gloucestershire Society.

The advantages of Agricultural Societies are generally acknowledged; they stimulate the industry of man by rewards, and a certain degree of honour and credit attached to them; they have been the means of disseminating widely the principles of a science before but little regarded, and less understood; they have also encouraged experiments, which could not have been made, but by inducing the great landlords to undertake the task, who could afford the first expence, bear the loss of an eventual failure, and employ the means they possess of making public the result of those experiments.

SECT. II.—WEIGHTS AND MEASURES.

In weights, the variation is trifling; but the inequality of measures is a kind of anomaly, which produces great inconveniences, and not unfrequently loss, to the purchaser. In Gloucester market, the bushel varies from nine to ten gallons: those who are in the constant practice of attending there, are aware of the fact, and therefore able to apportion the price. The great dealers obviate the evil, by stipulating for a certain weight; but when corn is purchased in smaller quantities, and directly from the market, the purchaser is obliged either to take the seller's word, or form a judgment from the best enquiries he can make on the spot. The bushel of the Forest district, and on the borders of Herefordshire, contains nearly ten gallons: on the Cotswolds, about nine: in the Vale, nine and a half: in the Lower Vale, and at Cirencester, nine and a quart, of all kinds of grain, though malt is said to be universally measured to nine. This freedom of measure, indeed, is carried to an extraordinary extent in this county. In a large portion of it, each farmer has his own measure, called by his own name, and his price fixed accordingly. In the market he frequents, it is understood. In articles of this sort, weight appears to be the fairest mode of dealing; and, therefore, in every market-house it were proper that there should be public scales, or a weighing machine, for the purpose, and that an average weight should be fixed, and placed in a conspicuous situation, for a bushel of the different species of grain.

Below Gloucester, particularly in the neighbourhood of Bristol, potatoes, green-peas, and some other articles, are sold by the double peck; that is, a peck contains two common pecks, "struck," or measured level with the top: whereas at Gloucester, and higher up the Vale, by a peck is understood one common peck, heaped up as long as they will stand, of the articles last-mentioned.

Wool is weighed by the stone of 12½*lb.* or todd of 28½*lb.* generally through the county.

Eighteen ounces of butter, with many dairy-women, still make a pound, though among many others reduced to sixteen; and in the higher extremity of the Vale, as at Welford, that article is sold by the quart, which is supposed to contain three pounds.

SECT. III.—SUPPLY OF LONDON.

The articles sent out of the county for the supply of London, in the agricultural department, are fat oxen, sheep, and pigs; corn, cheese, fruit-liquors, and salmon. Of these, it is difficult to ascertain the annual quantity, without other documents than what are supplied in the country.

In the commercial department, cloths of different qualities, to a very large extent, are manufactured for the London market.

SECT. IV.—EXPERIMENTAL FARMS.

Though a spirit of agricultural improvement has been strongly excited among the land-owners of the county, and many advantages resulted from it, yet no farm strictly experimental can be pointed out.

CONCLUSION.

MEANS OF IMPROVEMENT,

AND MEASURES CALCULATED FOR THAT PURPOSE.

ON the subject of long leases, as a means of improvement, different opinions are held. There are circumstances and situations, which make leases inconvenient or improper: upon rich pasture lands they are not necessary, though, even here, a confidential assurance should be given to the tenant, to induce him to act upon principles beneficial to the estate. Upon all tillage farms, where good or bad management materially affect the value of the lands, leases are indispensible. Should the proprietor imagine, that, by granting a term of seven or fourteen years, he gives power to the tenant of continuing a prejudicial course of management, let it also be considered, that, by withholding a lease, he prevents any attempt being made for great or permanent improvement.

Supposing the land-owner satisfied as to the utility of granting a lease, the next consideration is, what length of term is most convenient, and what covenants and provisions most conducive, to an indemnification of expence on one hand, and amelioration of property on the other.

In all recent inclosures of waste, fourteen years at least should be given, at a moderate rent, so that the tenant may be compensated for expences he must necessarily incur in the cultivation of lands hitherto unproductive. In the allotments of waste to ecclesiastical persons, this allowance is still more necessary, as probably buildings must be erected, at an expence too great for a limited income and life-interest tenure. To excite, indeed, a spirit for improvement, and hold out a prospect of remuneration for increased industry, it is right to extend the period, in most cases, to twenty-one years, subject to the contrôul of Patron and Ordinary, as is found in special acts of inclosure.

With respect to covenants, there are some principles in which all are agreed; among these, are such as restrain the lessee from assigning his lease, or setting any part of his estate, to under-tenants, and to secure such a continued management, as shall prevent the tenant from drawing extraordinary profits by forced and exhausting crops: but as to the mode of cultivation, soils vary so much, not only in whole parishes, but even on farms, and of consequence require so many different modes of treatment, and rotation of crops, that it is difficult on a recent inclosure from waste, to lay down a certain rule capable of being applied to all cases; but as it is the interest of the tenant to find out and pursue the most beneficial and productive course of cultivation, such as will insure a certain advantage to himself, might not a discretionary power be given him for the first seven years; and, from the experience of that period, might not a proper rotation be laid down for the remainder? This would secure the interests of the landlord, and be the means of keeping the farm in good condition.

On old inclosed estates it is not prudent in the landlord, nor beneficial to the agricultural system, to place the tenant too far out of reach by a long term: he should have time to carry him through one rotation; and, according to the propriety and activity of his management, and conformity to the covenants of his lease, should be continued or removed, at the will of the landlord. In the Vale, the takings are frequently for three or four years, according to the course of crops; and those estates are neither managed worse, or less productive than others which are held under a longer term. The occupiers, indeed, have an assurance on the honour of their landlord, that they shall continue in the occupation so long as they conform to the conditions of the original contract; and seldom does an instance occur of a dispossession by the caprice of the proprietor, without misconduct on the part of the tenant.

In the Vale, the occupiers are not left sufficiently at liberty to make the most of their lands. Whether the land be good or bad in its own nature, or well or ill cultivated; whether it be suited or not to the customary crops, the cultivator is tied down to the same routine which has been pursued for ages, without being allowed to try the effect of experiment, even at his own risque. Obvious means of improvement here offer themselves; but they rest with the landlord, and must be brought forward by his liberal determination to lay aside the prejudices of ancient custom.

It is unfortunate for the improvement of the country, that no practicable method has yet been generally introduced, which shall make it the direct interest of the tenant to leave his farm, at the expiration of the lease, in a proper state of fertility. Might not the following plan be beneficial both to landlord and tenant?

The landlord to allow the tenant a proper sum of money for every cubic yard of good spit-dung he shall leave, either in the yard, or carted out to the arable land, and laid in square heaps six feet high, and which have been once turned three months or more before the expiration of his lease; another sum for every yard of long dung; so much for every load of straw kept dry beyond a limited quantity; and another sum per square yard for every yard of dung put on the land for turnips the preceding year, provided the turnips were well hoed: but all these allowances on condition that the tenant should not obtain straw and dung by cross cropping his land, and the allowance for straw less than in proportion for the same of dung. This would give the tenant an interest in keeping his land in high cultivation, because the richer the land, the more straw would it bear. This plan is chiefly calculated for estates on the Hills; but, with a little variation, may be adapted to those in the Vale.

Underground draining being universally acknowledged to be one of the first modes of improvement on wet soils, but frequently neglected for want of ascertaining how or by whom the expence should be discharged, a lease to the following effect is recommended, in imitation of one granted of a farm in North Wiltshire. The term is for fourteen years; but either party is at liberty, at any period, to make it void, by giving the other three years notice. The tenant covenants to lay out 300*l.* in draining the land, under the landlord's direction, within three years after the commencement of the lease. One condition is, that he shall receive back as many fourteenth parts of that sum, as there shall remain years unexpired, when he quits the farm, should he happen to quit it before the expiration of the lease.

Roads.—The general use of narrow-wheeled waggons and carts, in this county, is very detrimental to the roads; and perhaps nothing would tend more to their amelioration, than the giving of encouragement to the more frequent use of broad wheels, by premiums or exemptions. An obvious mode of exemption, in addition to the one already given by the Act 13 Geo. c. 84, may be adopted, in apportioning the quantity of statute labour on the turnpike-roads, to the width of the wheels employed by the occupiers liable to perform. Were an Act framed upon this principle, the proportion might easily be ascertained, and other subordinate circumstances arranged. As the highway laws at present stand, they are not perhaps quite consistent with equity and justice, which would require, that every person should contribute in proportion to the injury he occasions; and it is unquestionable, that the injury done to roads by narrow-wheeled carriages, is much greater than the other.

ON PLANTING THE ORCHIS.

The herbage of many pastures in the Vale is very coarse, and mixed with knap-weed, orchis, and other plants, which cattle refuse. Nature points out the useful application of soils where these grow: and the nutritive and medicinal qualities of the orchis are sufficiently ascertained, to justify a closer attention to it than has hitherto been paid; and the value of the root, when properly prepared, offers an inducement to attempt the propagation of it on a limited scale.

The *orchis mascula* of Linnæus, or *satyrium mas* of the Edinburgh Dispensatory, grows plentifully in moist meadows, bearing six or seven long smooth narrow leaves, variegated with dark coloured streaks or spots, issuing from the root; one or two embrace the stalk, which is single, roundish, and striated: on its top appears a long loose spike of irregular, naked, purplish, red flowers, consisting each of six petals, one of which is large, cut into three sections, hanging downwards; the others smaller, forming a kind of hood above it, with a tail behind. The root consists of two roundish, whitish tubercles, about the size of nutmegs, one plump and juicy, the other fungous and somewhat shrivelled, with a few large fibres at the top. It is perennial, and flowers in May, and may be propagated by seed.* The seeds should be collected in the places where the plants grow naturally, and directly sown in the garden, on a border of light earth, and raked in with an even hand. The plants, when a year or two old, may be set out in rows, about eight inches asunder, and four inches distant from each other in the line. Seeds should be sown every year, to keep up a succession of plants, if in fact no offsets are produced.

Premiums have been offered by the Society of Arts and Sciences in London, for encouraging the propagation of this plant.

The bulbs of the root, which is the only useful part, are prepared in the following manner, as directed in the Philos. Transact. vol. 59. The bulb is to be washed in water, and the fine brown skin which covers it, is to be separated by means of a small brush, or by dipping the root in hot water, and rubbing it with a coarse linen cloth. When a sufficient number of bulbs have been thus cleansed, they are to be spread on a tin-plate, and placed in an oven heated to the usual degree, where they are to remain six or ten minutes, in which time they will have lost their milky whiteness, and acquired a transparency like horn, without any diminution of bulk. Being arrived at this state, they are to be removed, in order to dry and harden in the air, which will require several days to effect; or, by using a gentle heat, they may be finished in a few hours.

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* The printed books direct the offsets to be planted; I have, however, never been able to procure an offset, though I took up more than a hundred plants in the course of the summer of 1805, nor have I ever observed them growing in bunches, which would be the case, like tulips and other bulbous roots, if they had offsets.

By another process, the bulb is boiled in water, freed from the skin, and afterwards suspended in the air to dry: it thus gains the same appearance as the foreign, and does not grow moist or mouldy in wet weather, which those that have been barely dried by heat, are liable to. Reduced into powder, they soften and dissolve in boiling water into a kind of mucilage, which may be diluted for use, with a larger quantity of water or milk. Thus prepared, they possess very nutricious virtues; and, if not the very same as is brought from Turkey, and used for making salep, so nearly resembles, as to be little inferior to it.

In Turkey, the different species of the orchis are said to be taken indifferently; but in England, the *orchis mascula* is both the most common and most easily propagated. The foreign salep is 3½*d.* per ounce retail; the English might be raised for two-pence an ounce, and leave a large profit to the planter, as appears by the following calculation:

DEBTOR.	£.	s.	d.
Rent for two years of an acre	2	0	0
Taxes	0	8	0
Digging, at 6*d*. per lug	4	0	0
Collecting seed for an acre	0	10	0
Sowing and transplanting	1	0	0
Hoeing and cleansing two years	2	0	0
Digging up	3	0	0
Drying and preparing	2	0	0
Tythe	0	12	0
Profit	20	4	0
	35	14	0

CREDITOR.			
Crop	35	14	0

In this calculation it is supposed, that, at four inches apart, and in rows nine inches asunder, 171,396 plants will grow on an acre; that they will weigh, when dry, 4,285 ounces; which value, at 2*d*. per ounce, gives 35*l*. 14*s*. and a fraction. The price and weight are taken low; the latter on the supposition that forty will weigh an ounce.* The rent and expences are estimated for two years, because no benefit arises in the first year: there is no doubt, however, but that the land would be in excellent condition, either for a second sowing, or for wheat.

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* The bulbs, from which this calculation is made, were small, having been collected in poor pasture land; but, it is conceived, they would be considerably improved in size and weight, by the mode of cultivation before recommended.

APPENDIX.

ON the subject of inclosures much has already been said, and, as some proof from fact of the advantages attending the system, on the Cotswolds, the following results are given of a comparison between the present state of the hamlet of Eastington, in the parish of Northleach, and the parish of Aldsworth, and what it was before the inclosure, or in open field.

The management of the field land in the latter state was "two shifts;" that is, one crop and fallow, alternately.

Average produce of Wheat crop	6 bushels per acre
Barley -	10 ditto
Oats -	10 ditto
About sixty acres of the fallow field was sown with Peas -	6 ditto

Sheep bred 200, and sold poor the second year at the latter end, then called shearlings: stock of the fields was consequently 400: wool produced from the same after the rate of eight fleeces to the todd.

Beasts bred, twenty in a season, and sold at different ages, after three years old: full stock in the fields, eighty beasts.

Quantity of Wheat,	200 acres	Produce,	150 quarters
Barley,	200 ditto	Ditto	250 ditto
Oats,	200 ditto	Ditto	250 ditto
Peas,	60 ditto	Ditto	40 ditto
Land in corn,	660 acres	Produce,	690 quarters

Wool of 400 sheep, 50 todds.

PRESENT STATE.

Average produce of Wheat,	-	12 bushels per acre
Barley,	-	22 ditto
Oats,	-	24 ditto
Peas,	-	16 ditto

Sheep bred annually, 500; the same number sold annually fat. Yearly stock kept up, 1500. Wool at the rate of five fleeces to the todd. A hundred beasts kept on the same, and 60 sold to the butcher.

Quantity of Wheat sown,	300 acres	Produce,	450 qrs.
Barley,	300 ditto	Ditto,	825 do.
Oats & Peas,	300 ditto	Ditto,	825 do.
Land prepared for corn,	900 acres	Produce,	2100 qrs.

It is supposed that the oat and pea crops are in such proportion as that the average produce of both do not exceed the average produce of barley.

COMPARATIVE VIEW.

Before the Inclosure.		*After Inclosure.*	*Improvement.*
Wheat,	150 quarters	450 quarters	300 quarters
Barley,	250 ditto	825 ditto	575 ditto
Oats & Peas,	290 ditto	825 ditto	535 ditto
	690	2100	1410
Wool, -	50 todd	300 todd	250 todd

Sheep, - none fed, 500, which estimated at 80*lbs.* each, add to the stock of animal food 40,000*lbs.* weight.

Also 60 beasts, estimated at 560*lbs.* each, give 33,600*lbs.* of beef in aid of the markets.

Rental in favour of the landlord, increased from 500*l.* to 1460*l.* per annum.

Aldsworth before Inclosure.

Management two shifts, crop and fallow.

Wheat, 200 acres, at 6 bushels per acre		5 1~~5~~0 quarters
Barley, 200 ditto, at 10	- - -	250 ditto
Oats, 200 ditto, at 10	- - -	250 ditto
Peas on fallow land called Etchings, 100 - - 6	- - -	70 ditto
700 acres		720 quarters

Sheep bred, 200. Full stock, 400. Wool at eight fleeces per todd. 600 sheep taken to agistment, at 1s. per head.

Ten beasts bred and kept till four years old. Ten sold yearly, and forty taken to agistment, at 5s. per head.

After Inclosure.

Wheat sown,	390 acres	Produce, 585 quarters
Barley,	390 - - - -	825 ditto
Peas & Oats,	390 - - - -	950 ditto
	1170	2360
	700 before inclos.	720 before inclos.
	470 acres added	1640 quarters

Sheep bred annually, 1800. Beasts ditto, 12. Sent to market, several being bought in, 20.

One thousand eight hundred sheep, at five fleeces per todd, produce 360 todd, which adds 310 todds of wool after the inclosure.

It is an argument not a little in favour of the inclosing system, that it has operated to the encouragement of labour. It is remarked, that labourers, who formerly were under the necessity of seeking employment in London and other places, now find it in sufficient quantity at home in their respective parishes. Hence, the apprehensions which were entertained, and produced a law against inclosures in the reign of Hen. VII. were ill-grounded, though that law received the praises of Lord Bacon. There seems, indeed, in all periods of our history, to have been an undeserved jealousy between agriculture and trade; and the laudable desire of promoting husbandry, frequently produced absurd limitations against the latter; while the apprehension of the decay of manufactures, from the too great encouragement given to the former, as frequently occasioned contrary restrictions, according to the humour of the King and Parliament. It is time that these jealousies should be done away, and that the merchant, manufacturer, and husbandman, should learn, that there is between them a reciprocity of interests, which can be supported only by union and mutual confidence.

It was intended to offer some further considerations on the Poor Laws, agreeably to the reference in page 66, line 6; but the subject being taken up seriously by Parliament, they are become unnecessary.

N.B. The *Welford* mentioned in page 108, line 27, is not the parish of that name in the upper part of Deerhurst Hundred, but the name of a hamlet near Fairford.

PRICES

OF BUILDING MATERIALS ON THE SPOT.

OAK timber, from 2s. to 3s. per foot solid.

Elm ditto, from 1s. to 1s. 6*d*. ditto.

Clamp-burnt bricks, 1*l*. 5s. per thousand.

Best bricks, from 1*l*. 10s. to 2*l*. ditto.

Clay stone lime at Gloucester, 1s. 8*d*. per barrel of two bushels.

Bristol stone lime ditto, 2s. per barrel.

Cromhall lime at the kiln, 7*d*. per barrel.

Plain tiles, burnt, 2*l*. per thousand.

Pan tiles, ditto, 3*l*. 10s. ditto.

Stone tiles or slates, from 18s. to 1*l*. per thousand, to cover two square of one hundred feet each.

Journeyman carpenter and mason's wages, from 2s. 6*d*. to 3s. 6*d*. per day.

Workmanship to a rod of brickwork, 1*l*. 10s.

Workmanship and materials to ditto, 9*l*. 10s.

Freestone paving, 9*d*. per foot.

Thatching with helm straw, 5s. per square, including spicks and rope yarn: will last thirty years.

Thatching with common threshed straw, something less.

Spicks, 4½*d*. per hundred. Yarn, 10*d*. per pound.

Three feet sap laths, at 1s. 8*d*. per hundred, require 300 of fourpenny nails, and, with a dozen and half boltings of helm, at 10s. per dozen, cover a thatcher's square of work, or 16½ feet square.

IMPLEMENTS OF HUSBANDRY.

Narrow-wheeled waggon, from 31*l.* 10s. to 36*l.* 15s.
Cart with six-inch wheels, 15*l.* 15*s.*
Ploughs, from 1*l.* 12*s.* to 3*l.*
Harrows and Drags, ditto.
Radway's double-furrow plough, 8*l.* 8*s.*
Ditto single plough, 4*l.* 4*s.*
Ditto skim plough, 6*l.*
Ditto chaff-cutter with two knives, 20*l.*
Lambert's draining machine, 52*l.* 10*s.*
Ditto chaff-cutter with four knives, 26*l.* 5*s.*
Threshing machine, worked with one horse and two women, 25*l.*
A one-horse power, to work either the chaff-cutter or threshing machine, 20*l.*
A revolving plough, to turn all the furrows one way, 11*l.*
Radway's skim-and-go-deep plough, 7*l.*
Scuffler, with a set of blades for paring, 12*l.* 12*s.*
Hinck's chaff-cutter with three knives, 8*l.* 8*s.* or 10*l.* 10*s.*
Hand hoe, running with a wheel, 10*s.* 6*d.*
Thistle drawer, 2*s.* 6*d.*
Ell rakes, from 16*s.* to 1*l.* 1*s.*
Winnowing machine, 8*l.* 8*s.*
Iron roller, 1*l.* 1*s.* per foot.
Drill plough, from 3*l.* 3*s.* to 5*l.* 5*s.*
Common fan or winnow, 1*l.* 10*s.*
Riddles. Pug riddle, 6*s.* Rind sieve, 4*s.* Wheat riddle, Barley ditto, and Bean ditto, 3*s.* 6*d.* each. Heaving sieve, 3*s.* 6*d.*
Staddle stones, 3*s.* a pair. Cow cribs, made of "withy," willow, 10*s.* a piece.

DAIRY UTENSILS. *See Chap.* 13. *Sect.* 1. *P.* 304.

CYDER-MAKING IMPLEMENTS.

Horse-mill and press, 35*l.* Hand-mill, 5*l.* Hair cloths, 3*l.* 12*s.* per dozen. Hogsheads, of one hundred and five gallons, from 2*l.* 2*s.* to 2*l.* 12*s.* 6*d.*

SEEDS.

Honeysuckle, 1*s.* per pound. Milled hop, 7*d.* ditto. Broad clover, 6*d.* ditto. Ray grass, 6*s.* per bushel. Peacey's ditto, something more. Turnip seed, from 1*s.* to 1*s.* 6*d.* per pound. Vetches, 9*s.* per bushel.

AGISTMENT PRICES.

Horses per week, 4*s.* Milking cows ditto, 3*s.* 6*d.* Oxen, 5*s.* Two year old heifers, 3*s.* Sheep per score, 10*s.* Ewes with one lamb, 9*d.*; or with two, 1*s.* a couple.

FUEL, AND TIMBER NOT USED IN BUILDING.

Coppice, by the statute cord of 8 feet long, 4 feet high, and 4 feet wide, or 128 feet cubic, from 16*s.* to 18*s.* Faggots, 10*s.* per hundred. Coals at Glocester quay, from 17*s.* to 1*l.* 1*s.* Beech and Alder, from 5*d.* to 7*d.* per foot. Ash, from 8*d.* to 1*s.* ditto. Whittern, or Whitrod, 7*d.* or 8*d.* ditto.

MANURE IN GLOCESTER.

Green or long dung, 12*s.* per waggon load. Spit or rotten ditto, 12*s.* ditto. Coal ashes, 5*s.* Soaper's ashes, 8s. Soot, 6*d*. per bushel. Feltmongers' refuse from the pits, 6s. per cart load. Street manure or sweepings, given to the scavengers for carrying away, being first collected into heaps in the street.

BLACKSMITH'S WORK.

Common heavy work, 6*d*. per pound: on the Cotswolds, something more.

Shoeing, 2*s*. 4*d*. per set, and 10*d*. for four removes.

DRAUGHT WORK.

Hire of a team (waggon, four horses, man and boy) per day, 1*l*. 1*s*.

Ploughing per acre, with four horses, 15*s*.

Harrowing per acre, 4*s*.

FENCES.

Planting quick hedge, digging ditch, double fencing with rended oak posts and three rails mortised, 13*s*. per lug, or perch.

Walling on the Cotswolds, 4 feet 8 inches high, covered at top with broad stones, without mortar, 8*d*. per yard.

Thorns for dry or dead hedging, on the spot, 1*l*. 1*s*. per load.

Stakes, from 5*s*. to 7*s*. per hundred. Withy sets, for planting in the fences, 4*s*. per dozen.

Oak gates with five bars, from 18*s*. to 1*l*. 1*s*.

Elm ditto, from 13*s*. to 15*s*.

Hurdles of sawed stuff, Elm rails, and Oak heads, 9*s*. a piece.

Ditto of split Ash, 1*l*. 1*s*. per dozen. Wattled ditto, 8*s*. per dozen.

PIECE WORK.

Breast-ploughing on saintfoin leys, burning and spreading, 1*l.* per acre: on Vale grass lands, 25*s.*

Breast-ploughing on pea stubble, or bean ditto, in the Vale, 7*s.*

Setting beans by line, 1*s.* 8*d.*; without line, 1*s.* 6*d.* per bushel.

Hoeing ditto, 6*s.* per acre. Hoeing wheat, twice doing, 7*s.* 6*d.*

Cutting beans with a cradle scythe, 7*s.* Reaping wheat, 6*s.* to 8*s.* 6*d.* including binding, and stucking.

Mowing barley, 2*s.*

Threshing wheat, 2*s.* 6*d.* per quarter.

Threshing barley, 2*s.* per quarter.

Hoeing peas, 3*s.* 6*d.* per acre.

Threshing beans, 1*s.* 4*d.* per quarter. Oats, 1*s.* 3*d.* ditto.

Mowing grass, from 2*s.* 8*d.* to 3*s.* per acre; or mowing and making at 10*s.* 6*d.*

Making split hurdles, 5*s.* 6*d.* per dozen.

Making hogshead hoops per bundle of thirty-six, 3*s.* 6*d.* Cleaving lath, from 2*s.* 6*d.* to 3*s.* per thousand. Making faggots per hundred, 2*s.* 6*d.*

YEARLY WAGES.

Headman, from 8*l.* to 12*l.*

Second ditto, from 6*l.* to 8*l.*

Boy, from 2*l.* to 5*l.*

Dairymaid, from 5*l.* to 10*l.*

Undermaid, from 3*l.* to 5*l.*

DAY-WAGES.

In winter, for men, 1*s.* 6*d.* per day, with drink.

———, for women, 10*d.* ditto.

In summer, for men, 2*s*. per day, with drink.

———, for women, 1*s*. ditto.

In hay-harvest, mowing, 2*s*. with drink, and three dinners in the week; or 1*s*. 6*d*. and all victuals. In corn-harvest, the same: women, 1*s*. with three dinners and drink.

On the Cotswolds, something less, and not so great an allowance of drink.

On the western side of the Severn, less than the Vale, with as much or more drink.

A

LETTER

FROM

EDWARD SHEPPARD, ESQUIRE,

TO

SIR JOHN SINCLAIR, BART.

ON THE SUBJECT OF

His EXPERIMENTS *regarding the* IMPROVEMENT

OF THE

Fine-woolled Breeds of Sheep,

IN THIS KINGDOM.

TO SIR JOHN SINCLAIR, BART.

PRESIDENT OF THE BOARD OF AGRICULTURE.

SIR,

In consequence of the application I had the honour to receive from you, requesting me to communicate such information as my experience in the breed of fine-woolled Sheep afforded, for the service of the Board of Agriculture, in the Survey now publishing by their authority, of the Agriculture of the County of Gloucester, I now transmit the following Account of my Flocks, with the observations that have occurred to me.

Anxious to ascertain to what degree of perfection wool might be brought in this country, by means of the Spanish cross on fine-woolled English sheep; and wishing to be satisfied whether, under the common circumstances of the husbandry of the country, such wool would retain its fineness, I commenced the following experiments, considering myself, from being largely engaged in the manufacture of superfine cloth, and in the practice of buying and working up very considerable quantities of Spanish wool yearly, entitled to form, with some accuracy, an estimate of the relative quality and value of such wools as might be produced in this country, in competition with the wools of Spain. Accordingly, in the year 1800, I sent twenty Ryeland ewes to a Spanish ram of Lord Bathurst's, by his Lordship's obliging permission; this ram was from his Majesty's Merino flock.

In the produce of this first cross, I found a surprizing improvement in the wool, partaking very strongly of the nature of the Spanish; to which I think it might be fairly considered as having approached half-way. I carefully preserved a large specimen of it, with a view to ascertain the important fact of subsequent depreciation. The weight of the fleece was increased one half, by the cross with the Spaniard.

In the year 1801 I was favoured, through the medium of Sir Joseph Bankes, with a Spanish ram and three ewes, from his Majesty's flock; and I purchased from four to five hundred Ryeland ewes, in that and the two following years. I selected, with great caution, the finest woolled sheep from the best flocks in Herefordshire, where I found an assemblage of all sorts under the name of Ryelands, and not above one in twenty that I could chuse for my use.

In the course of the years 1803 and 1804, I purchased a considerable number of ewes from a reputed Spanish flock in Herefordshire, Mr. Ridgeway's; who had for many years been in possession of part of his Majesty's Merino sheep, obtained, as well soon after their arrival, as at subsequent periods, through the means of his landlord, General Price. This Spanish race Mr. Ridgeway ingrafted on his own Ryeland flock; and I found the produce, as might be supposed, a very mixed and unequal breed. I could only purchase ten ewes of him in 1803, as he had just sold a quantity to the Marquis of Exeter, which were afterwards disposed of by auction, at Burleigh, on the Marquis's death. In 1804, I purchased one hundred more ewes of Mr. Ridgeway, which he permitted me to select from his flock: of course, I drew such as were the least degenerated from the Spaniard; and amongst them I found many that were very little, if at all, inferior in wool to his Majesty's pure breed. I purchased forty ewes of the same description from a mixed flock of Lady Caroline Price's; and classed the whole, according to their respective qualities, as second, third, and fourth crosses from the Spaniard.

In the year 1805, I was enabled, from the increase of my flock, to dispose of all my Ryeland ewes. At this year's shearing, the average weight of my fleeces was 2¼*lb.* washed on the sheep's back.

In the present year, 1806, my Spanish and mixed flocks amount to 986, exclusive of lambs; and the average weight of each fleece, washed as above, exceeds 3*lb.* The value of my wool, from the different crosses thrown together, I estimate at near 4*s.* 6*d.* per *lb.* and that of the fleeces exclusively Spanish, R's. at 6*s.* 4*d.* when in the same state as the wool brought from Spain; the price of the best Spanish wools of this year's import being 6*s.* 9*d.* per *lb.**

I have found it expedient to wash the wool on the

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* On breaking and sorting this wool, the actual produce was as as follows:

930 Fleeces,	Weighing	2621*lb.* R's. wool, at 5*s.*	£610	5	0
	Ditto	336*lb.* F's. and T's. wool, at 3*s.*	57	15	0
	Total weighing	3006*lb.* mixed breed, as only washed on the sheep's back, average value about 4*s.* 5½*d.*	668	0	0
6 Fleeces,	Weighing	22½*lb.* entire Merino Spanish, clean scowered, R's. wool, at 6*s.* 4*d.*	6	19	0
	Ditto	4½*lb* ditto, F's. wool, at 5*s.*	1	2	6
986 Fleeces,	**Weighing**	**3033*lb.* of Wool, at 4*s.* 5½*d.***	**£676**	**1**	**0**

sheep's back, in the common way practised in this country; for, although the wool of the real Spaniard is so close and compact as to admit of but little impression on the grease, at the root of the fibre, from common washing, yet the dirtier part of the fleece, near the surface, is considerably cleansed; and the more yolky and pure grease yields easily to the usual process of the manufacturer. In proportion as the cross from the English approaches the Spanish breed, it acquires the same property of *yolk;* but in every instance that I have seen, it parts much more easily with its grease in the washing. The process of shearing is also much facilitated by the wool having been washed on the sheep's back, which is otherwise very tedious and difficult. To attempt cleaning the wool after it is shorn, as practised in Spain, would be attended with insuperable difficulties to the grower, were no other objections attached to it; and, if left in its full state of grease, it would be very disadvantageous to the manufacturer, as the process of scowering, as practised with the Spanish wool, would be much injured and impeded by the frequent soiling of the liquor, used in the operation. It is farther recommendatory of the practice of washing the sheep, that such is in use in Spain, with a view to the health of the animal, though not as preparatory to the shearing.

I consider also the wool produced in this state—that is, washed from the sheep's back—as in the most merchantable state; it is sufficiently free from excessive grease, to enable the manufacturer to judge of its probable waste, which experience will soon render him competent to do; and thus remove a temporary impediment to the sale, which the novelty of the condition of the wool occasioned. The attempt to produce the wool scowered clean, would be much more objectionable; as, from the inexperience of the party, it would most probably be injured in its softness and quality.

I have not found it expedient to shear or wash my lambs, as I find them winter better with their coats on, and the wool is but of comparatively little value, and not marketable. It makes an addition to the more valuable fleece of the next year, in which state it is worked up better by the manufacturer, and the cost and trouble of twice shearing is saved.

The first reflection that occurs on the adoption of this breed of sheep, is, whether it is likely to be advantageous to the community; and on this head I cannot but give a decided opinion, that the judicious culture of fine wool must be productive of the greatest benefit to the agricultural, as well as to the commercial interests of the country. In the great variety of soil and situation which England produces, there are numberless districts where this breed of sheep may be cultivated with the greatest success, to the expulsion of the wretched and unprofitable flocks that now infest them. I am of opinion, that there is not a breed of clothing-woolled sheep in England, which would not produce a fleece, from four or five repeated crosses with the Spaniard, worth at least 4s. per *lb.* washed on the sheep's back. It seems therefore apparent, that it must be to the interest of the farmer and the community, that poor and mountainous tracts of land should be applied to the growth of this sort of sheep. As to the more rich and highly cultivated parts of the kingdom, I acknowledge a different opinion: I would wish such to be left in possession of the large and long-woolled flocks, which thrive so well upon them; for I am satisfied they would not be so well adapted to that sort of culture, the main object of which is the fineness of the fleece.

The comparison of four years successive produce from the same sheep; has satisfied me, that, without extraordinary care, to guard against the effects of climate, and a strict abstinence from the more nutritious and succulent kinds of food, the wool of the mixed breeds will materially degenerate. I have now before me, large samples of the wool of my first crosses, from Lord Bathurst's ram on my Ryeland ewes, shorn in 1802, (having been shorn as lambs the year preceding,) and of the wool from the same sheep, shorn in the present year, 1806. The quality of the wool in the course of that time, has so much degenerated, that I should conceive the lapse of a similar period would reduce it to the coarseness of the maternal stock. It may be proper to observe, that these sheep have been kept on rich pasture land, and fed this spring on turnips and vetches: it must be observed also, that they were only the first cross from the Spaniard, which, as I shall afterwards explain, I do not consider as possessing equal preventatives with those of higher blood, against the causes of degeneracy.

I have found also the wool of his Majesty's ram much degenerated, from the comparison of specimens in 1803 and the present year. He has been kept in the highest state possible, on the best pastures in the summer, and with corn in the winter, and has been very hard worked. I do not find such depreciation in the wool of the female produce from his Majesty's ewes; they have not been kept in such high condition, and their fleeces are as fine as those of the original ewes, which died after bringing two lambs each.

In the *pure Spanish breed*, there is a wonderful capacity for resisting the effects of climate on the quality of the wool. The extreme exudation from the body of the animal, yielding a yolky consistence at the interior of the fleece, and, by its mixture with the soil, forming a kind of coat of mail on the outside, makes the wool almost impervious to wet, and protects the sheep exceedingly from the injuries of climate. The same quality attends the mixed breed, in proportion to its approximation to the pure Spanish; and I have no doubt, that the more it inherits of this quality, the more capable it will be of resistance to the causes of degeneracy.

I do not consider the fact of deterioration under the common circumstances of the husbandry of the country, as affecting, in any serious degree, the value arising from the growth of fine-woolled sheep. The preventative is always at hand—a frequent recurrence to the Spanish ram will be necessary, and will at all times be adequate to remedy the evil. A sort of wool will be produced that will be highly valuable to the manufacturer; and if we grow, in considerable quantities, wool worth 5*s*. 6*d*. per *lb*. which will be very practicable, (the comparative price of the best Spanish wool being taken at 6*s*. 9*d*.) we shall rival two-thirds of the import from Spain. It is to be observed, that the Spanish wool, coming in so much cleaner condition, adds 6*d*. per *lb*. to its value, compared with that of our own growth, washed on the sheep's back, of equal fineness.

But in order to keep up the means of perpetuating the fine-woolled mixed breed, and of supplying the growers with the pure blood, there should be a *depôt* of the real Spanish race carefully preserved, and protected from any mixture or degeneracy. The flock now in his Majesty's possession is eminently fitted for the purpose;

and, under such beneficent and patriotic auspices, I have no doubt, will have every attention paid to the preservation of its purity. I am satisfied that a breed of sheep so pure as those are, with strict caution both to the nature of their food, and to their complete protection from the effects of climate, would remain for a century in the same state of fineness and perfection: indeed, we have no experience that will assign any period to their decline. In Saxony, under those precautions, the mixed breed retains the greatest possible degree of fineness: the best wools from that country equal, in smallness of fibre, and exceed in softness of feel, the finest wools of Spain, and are eagerly purchased, at even higher prices, by the manufacturers in this country, who have no difficulty in ascertaining the value and the waste, in the greasy and half-washed state they appear in; though the timid growers of fine wool here, are alarmed at the apparent difficulties which the sale of their wool meets with in similar condition. They may be assured, that, when a quantity can be produced sufficient to attract the manufacturers attention, there will not be much difficulty in his ascertaining the value, let the condition or the grease be what it may.

The mixed breed of English and Spanish, partakes very much of the soft and silky feel of the Saxon wool, and, was the same attention given to its culture, I have no doubt might be brought to equal fineness. That the cross with a coarser wool should have produced a softer and a finer wool than that of the fine parent fleece, is an extraordinary fact; but we now know it to be true from the indisputable proof of the Saxon wools. I am, however, disposed to attribute much of the softness perceptible in Saxon, and Anglo-Spanish wools, to the management in washing. In Saxony, as with us, the wool is washed on the sheep's back, and remains for a long time afterwards in its native grease, till sent into this country, not hardened by any process. In Spain, the wool when shorn is taken to the washing places, where, first with warm, and afterwards with cold water, the grease is in a great degree discharged: it is then exposed to a burning sun, and, when scorched thoroughly dry, is squeezed into packages, and compressed so closely, that, on being opened in this country, it has acquired such hardness as frequently to make it difficult to divide the flakes. The feel of the wool in this state is so unlike that of wool kept in a portion of its natural grease, that I very much doubt its capability of again recovering its original temper, even in the softening processes of the manufacture. It would be difficult to procure the Spanish wool in the unwashed state; and the duties being paid by the weight, would prove an insurmountable impediment. The Spanish lambs' wool, which comes in more of its native grease, has all the softness of feel that can be wished.

Having been favoured with an authentic account of the history and management of the fine-woolled sheep in Saxony, from an intelligent native of that country, who has for many years been in the practice of purchasing very largely from the growers there, I think such may be an acceptable communication to the public.

The first introduction of Spanish sheep into Saxony, took place in the year 1713; and a further import was made in 1740. They were divided among the Electoral flocks, and thence spread among the farmers, who crossed them with their native breed, a very coarse-woolled sheep. The farmers in Saxony pay great attention to every thing which affects the quality of their wool; they house the sheep regularly as the frost sets in, which, in a hard winter, lasts four or five months. They protect them with equal care from the effects of humidity; for whenever it is wet, or even if they perceive a thunder-storm approaching, they drive them to shelter. They are particularly attentive to the pasturage of their sheep, as they take them to the highest mountains and forests, for the sake of healthy and dry herbage; considering the more luxuriant food of the low lands, and meadows, to be detrimental to the fineness of the wool. They feed them only on hay in the winter months, except in a few instances, where they have used a kind of oat-cake, mixed with salt. They consider turnips, and all succulent vegetables, to be injurious to the fineness of the wool; and that, as such food tends to enlarge the size of the animal, it produces a corresponding coarseness in the hair. Indeed, the weight of the Saxon fleeces, connected with their fineness, corroborates the opinion, as their average is not more than *2lb.*

The climate in Saxony is exempt from one material impediment to the culture of fine wool, namely, too great humidity. The spring and summer being very fine, and the autumn much drier than in this country, the weather is also not so changeable, nor are fogs prevalent.

In Sweden, where the Spanish breed has been propagated in very high perfection, and wool of extreme fineness produced, the sheep are carefully protected during the winter from the severity of the cold, and are housed from six to eight months; and even large flocks have been clothed. During the other seasons, the climate, which is neither humid nor foggy, seems well calculated to preserve the fineness of the fleece.

Although some modern writers, and, amongst others, M. de Lasteyrie, in his Treatise on Spanish Sheep, have asserted, that the quality of the wool does not depend upon the nature of the pasturage, I cannot think they are borne out by facts or by sound reason. That, to a certain degree, as far as being essential to the health of the animal, nutritive pastures are necessary to the production of good and healthy wool, I readily admit; having frequently observed, that the wool of a half-starved sheep is sickly, and void of proof in manufacture. But, when the animal is kept high, and, by nutritious food, pushed forward in its growth, I am convinced that the fibre enlarges with the other parts of the frame, and that, whenever an increased weight of wool is so produced, a deterioration in quality attends it. I am speaking of increased weight from the improved condition and keep of the sheep, not of that increase of weight in wool which the cross with the Spaniard always occasions, and which is accompanied with increased fineness.

M. de Lasteyrie makes mention of a flock of sheep in Spain, bought lately by the Prince of Peace, at a high price, on account of some privileges of pasturage that have exclusively belonged to it. This flock is called the *Real Paular*, and the pile of wool it produces is well known in this country. The information given by M. de Lasteyrie, of its having the privilege of a priority in feeding on the finest pastures, in its way to the mountains, has been confirmed to me by persons resident in Spain, and conversant in the history of the Spanish flocks. The sheep of this flock, from the advantages of pasturage, are large and handsome. The wool of this pile is well known to the manufacturers here, as broad, and coarse in hair, in comparison with other fine Leonesa piles. I conceive, that the habitual indulgence in more luxuriant food must have deteriorated the wool of this flock, as it was in the highest estimation in this country fifty years ago; when it was the practice for the manufacturers to mark their cloths with the name of the pile, viz. "Best superfine Paular;" which I have often seen, in the decline of the custom, about twenty-five years since. At present it is a wool not in much esteem, and ranks perhaps with the lowest of the prime Leonesa piles, in point of fineness of hair.

I cannot, indeed, attach any great weight to the observation of M. de Lasteyrie, on the subject of depreciation, when I find him asserting, that the fineness of the wool is not at all owing to pasturage, soil or climate; when he says, that the richer and more succulent pastures increase the fineness of the wool, and that dry herbage, such as broom and thyme, contribute to its coarseness. Yet amidst these errors, and many others, he has communicated much pleasing and useful information.

Respecting the fine-woolled flocks in France, M. de Lasteyrie informs us, that there were 5000 real Spanish sheep at Rambouillet, procured from Spain since the year 1786. The wool, he says, is increased in length, but not depreciated in fineness; an assertion I must doubt, as contrary to the experience I have had in wool. The ram's fleeces, he says, weigh, unwashed, from 12*lb.* to 13*lb.* in France, which agrees with the weight of the fleeces of high-fed Spanish rams in this country; and, varying so much from that of the low-conditioned rams in Spain and Saxony, produces another proof of the increased weight being occasioned by extraneous causes.

To conclude—I do not assert, that it is impracticable to produce, and to preserve in England, wool equal to the finest quality in Spain, with the same management as is practised in countries under climates somewhat similar; but that, where land is so valuable, and where a regular course of husbandry is adopted on a comprehensive scale, as with us, I do not think such management can be looked for. The culture, however, of such wool, as I have before pointed out, may be pursued with the greatest ease, as well as advantage, in the many districts of less fertile land throughout the kingdom; where, I am convinced, the farmers, in the course of three or four successive crosses with the Spaniard, would obtain fleeces worth from 10s. to 15s. each, from almost any sort of short-woolled sheep.

To those who can afford to chuse a sort of sheep to breed from, I should recommend a judicious selection of fine-woolled Ryelands, in preference to South Downs, or any other. The South Down flocks are equally mixed with the Ryelands, of coarse and fine-woolled sheep; but the finest hair of the South Down sheep bears no proportion, in point of softness, to that of the Ryeland.

Nor are the sheep from such cross with the Spaniard, less healthy, nor more subject to the foot-rot, or any other diseases. As lambs, they are tender; and it is necessary the ewes should yean as late as the month of March: the lambs fall very naked, and must be sheltered from bleak and exposed situations. After shedding their lambs' teeth, they are as healthy and strong as any sort of sheep whatever: they keep themselves in good order upon bare pastures; they go well to fold, which they stand equal with the South Downs; and I have found them fatten very handsomely. I have, in the past week, sold half a score six-toothed wethers of the first cross, fatted on grass and hay; for which I received from the butcher 22*l.* 15*s.* exclusive of the wool. I cut 5¾*lb.* of wool, in the grease, from one sheep, which, when clean scowered, produced 3¼*lb.* well worth, in that state, 5*s.* per *lb.* The other fleeces average rather less. This great growth of wool since last shear-time, I attribute to the great fatness and enlarged size of the sheep, which weighed 21*lb.* per quarter; the average weight was 19*lb.* per quarter; the whole value of carcase and wool exceeding 3*l* in addition to the fleece at last shear-time, worth 15*s.* I readily obtained a penny per pound more than the market price, on account of the beauty of the meat, and its great fatness; and I must not omit the testimony, both of amateurs and adversaries, to the mildness and excellency of the mutton.

I have the honour to be
Your obedient and faithful humble servant,
EDWARD SHEPPARD.

Uley, Gloucestershire,
Dec. 31st, 1806.

INDEX.

A.

ACORNS, planting of, *page* 244—Acres, number of, 1—Aftergrass, 187.—Agistment prices, 385.—Agriculture, restraints on improper, 364.—Agricultural Societies, 368.—Alabaster, 24.—Allotments for the poor, 64—Apple-trees, blight of, 202.—Apple-trees, insects on, 205—Apple-trees, methods of fencing, 214.—Apple-trees, soil for, 209.—Apples, sorts of, 232.—Avon river, 25, 26, 28.

B.

Barley, 119.—Barley, Siberian, 139.—Barns, 43—Bast, 247.—Beans, 124.—Bean-straw, 127.—Bees, 326—Berkeley Canal, 30.—Blue-bonnet weed, 164—Blue-clay, 19—Blue-clay stone, 23.—Boister, milk, 299—Boltings of straw, 119—Braids, what, 217—Bream, fish, 28—Breast-plough, 266.—Building-materials, 383—Butter, 298.—Butter-milk, 298.

C.

Cabbages, 154.—Calves, diseases of, 302.—Calves, feeding, 191.—Calves, rearing, 299—Canals, 29, 336—Canker, 207.—Capital, necessary, 58—Carnation-grass, 167—Carts, 82—Catch crops, 105—Cattle, 282—Cattle for feeding, 187.—Chaff-cutter, 86.—Cheese-heaving, 295.—Cheese-heaving, to prevent, 297—Cheese-making, 288.—Cheese-press, 294.—Charlock, 160.—Chelt, 25.—Chesnut, extraordinary one, 240—Chick-weed, 164.—Churns, 298—Climate of Cotswolds, 13—Ditto of Forest, 14.—Ditto of Vale, 13—Coal, 21—Coke, 21.—Commerce, agricultural, 343—Commerce, manufacturing, 343.—Commutation of tythes, 62—Composition of tythes, 61—Copper-slag, 335.—Coppice-woods, 246.—Corn-convolvulus, 163.—Corn-crowfoot, 162.—Corn-factor, 54.—Corn-horsetail, 162.—Corn-mint, 162.—Corn-rents, 63.—Corn-thistle, 163—Corn-weeds, 160.—Cottages, 47—Cottagers' gardens, 196.—Cottages, plan of, 50.—Cotswolds, 12—Couch-grass, 163—County, division of, 2.—County, form and boundaries, 1—County, geography of, 1.—County, hundreds of, 3.—Covering, tiles, 24.—Cow, not useful to cottagers, 48.—Cows, 281.—Cows, diseases of, 301.—Cows, management of, 285.—Cows warping, 297.—Cradle-scythe, 88.—Crops, rotation of, 107 —Crow-foot, 171.—Cyder-making, 220.—Cyder-mills, 222.—Cyder-press, 225.

D.

Dairy, profit of, 303 —Dairy-stock, 299 —Dairy-utensils, 304.—Dill, 181 —Docks, 169 —Dodder, 162.—Draining, 258.—Draining, curious mode of, 263 —Draining-plough, 84, 260 —Drag, 85.—Dray, 82—Drilling-machines, 84 —Drilling wheat, 111.—Drilling barley, 121.—Drilling beans, 125.—Drilling peas, 128.—Drilling turnips, 135.—Drilling teasles, 159 —Dung-pots, 82.—Dung-heaps, 268.

E.

Ell-rake, 84.—Estates, management of, 34.—Expence and profit of farms, 67.—Experimental farms, 370.—Ewelm stream, 26.

F.

Fairs, list of, 339 —Fallowing, 104.—Farm-houses, 43 —Farms, large, 52.—Farms, general size of, 52 —Farm, profits of, 68.—Feeding, 187.—Fencing inclosures, 93.—Fencing-stocks, 214.—Fermentation of liquors, 229 —Fish in the Severn, &c. 27.—Flax, 151.—Flea on flax, 153.—Fly on turnips, 135.—Fly on teasles, 158.—Flooring of stone, 46.—Folding of sheep on wheat, 15 —Forest of Dean, 12, 244 —Forest district, 12 —Free-stone, 23 —Frome river, 25, 26.—Fuel, 330 —Fuel, price of, 385.—Furrows, deep, 103.—Furze for fuel, 332.

G.

Gardens, 196 —Gates, 100.—Gloucester and Hereford Canal, 30.—Grafting, 216 —Grafting, new mode of, 218 —Grasses, artificial, 174 —Grasses, natural, 167.—Grip-flooring, 46.—Grubs on flax, 153.

H.

Hairough, 162.—Hand-hoe, running, 87.—Hand cyder-mill, 222.—Harrow, 85.—Hay-harvest, 182.—Hay-making, 183.—Hedges, 97.—Hemp, 154 —Hereford and Gloucester Canal, 30.—Hoe, running hand, 87.—Hogs, 322 —Hogs, feeding, 193.—Hedge-rows, 97.—Hitching, 130 —Hop-clover, 180.—Horses, 313 —Horse cyder-mill, 222.—Horses and oxen compared, 318.—Houses of industry, 348.

I.

Ignition of hay, 184.—Implements of husbandry, 81.—Implements, prices of, 384 —Inclosing, advantages of, 39, 379.—

Ditto, expences of, 91—Ditto, methods of, 93.—Inundations, effects of, 165.—Iron, 20.—Isis river, 28.

L.

Labour, price of, 328.—Lambs, 317—Lambs, reddled, 317.—Land lost by canals, 337.—Lattermath, 187—Lead, 21—Leases, 66.—Leases, improved, 371.—Leden river, 25.—Lime stone, 23.—Lime-compost, 149.—Linseed-oil cakes, 190.—Lucerne, 181.—Lumbert's draining-machine, 260.—Ditto, improved, 261.

M.

Manures, different kinds, 269.—Manures, price of, 385—Manuring, 267.—Manufactures, 341—Markets, 339—May-weed, 161.—Marle, 151, 271—Meadows, 165.—Means of improvement, 371.—Measures, unequal, 369.—Melelot, 163.—Minerals, 20.—Misseltoe, 207.—Moss, 208.

O.

Oak, remarkable one, 241.—Oaks, transplanted, 244.—Oats, 124.—Oats, quantity consumed, 320.—Oats, Siberian, 139.—Oats, wild, 164.—Obstacles to improvement, 363.—Orchards, 202.—Orchis, planting, 375.—Oxen, 319.

P.

Paring and burning, 264.—Parishes and places, 3.—Pasture-lands, 167.—Paving-stones, 23.—Pawn-brokers, 344.—Pears, 235.—Pear-tree, remarkable, 220.—Peas, 128.—Peat for fuel, 332.—Peaty earth, 19.—Piece-work, 387.—Pigeons, 325.—Plantations, 243.—Planting acorns, 244.—Planting fruit-trees, 213, 236.—Ploughs, 82.—Ponds for water, 31.—Poor, 343.—Poor-rates, 64, 346—Poor children's work, 346.—Poppy, 162.—Population, 351.—Potatoes, 140.—Potatoes, to preserve, 143.—Poverty, causes of, 344.—Poultry, 323—Pouse, what, 129—Property, state of, 34.—Proprietors, list of, 38.—Provident Societies, 348.—Provisions, rate of, 329.—Pruning, 206.—Pucks of wheat, 147.

Q.

Quickset-hedge, 93.

R.

Rabbits, 322.—Rape, 154—Ray-grass, 179.—Ray-grass, Peacy's, 179.—Rennett, to make, 288.—Rents, 58.—Restraints on tenants, 364.—Risbalking, what, 110.—Rivers, 24.—Roads, 335.—Roads, how formed, 335.—Rollers, 86.—Rolling wheat, 116.

—Ropes of bark, 247.—Rotation of crops, 107.—Rotation of crops, new, 108.—Rowens, 128.—Rye, 138.—Ryelands, 138.

S.

Saintfoin, 175.—Salep, English, 377.—Salmon, 27.—Samlet, 27.—Scuffler, 85.—Seven-field husbandry, 107.—Setting wheat, 114.—Severn, 25, 27.—Sheep, 305.—Sheep, diseases of, 314.—Sheep, feeding, 193.—Sheep, Spanish cross, 311.—Siddow-peas, 128.—Slugs on turnips, 135.—Smiths' work, price of, 386.—Smut, 112.—Soil of the Cotswolds, 15.—Soil of the Forest district, 19.—Soil of the Vale, 17.—Soil red, principles of, 18.—Staddles, 43.—Stall-feeding, 188.—Steeping wheat, 114.—Stocks, raising them, 211.—Stone-wall fence, 99.—Stroudwater Canal, 29.—Stubble, 118.—Supply of London, 370.—Swedish turnip, 134.—Styre-apple, 232.

T.

Tables of population, &c. 352.—Tansey, 171.—Tares, 130.—Taskers, 118.—Teasles, 155.—Tenants, too much restrained, 364.—Tenures, 35.—Thames and Severn Canal, 29.—Thatch, 45.—Thistles, 163, 168.—Thistle-drawer, 87.—Threshing-machines, 85.—Tide, 27.—Tiles, stone, 24.—Tillage, 101.—Timber, to supply, 366.—Treading with sheep, 111.—Tunnel, 29.—Turnips, 132.—Tythes, 59.—Tything system, 363.

V.

Underground-draining, 259.—Vetches, 130.—Village-shops, 345.

W.

Wages, 387.—Waggons, 81.—Wains, 82.—Wall-fencing, 99.—Walnut-tree, 245.—Wastes, 250.—Waste-land converted, 253.—Washing cyder, 228.—Water, qualities of, 32.—Water, saline, 33.—Watering, advantages of, 280.—Watering lands, 275.—Weeds on corn-lands, 160.—Weeds on grass-lands, 168.—Weeding, 273.—Weights, 368.—Wheat, 109.—Wheat-straw, 119.—Whey-butter, 298.—White-clover, ill effects of, 302.—Whittern-tree, 247.—Willow, 248.—Winnowing-machines, 85.—Winrush river, 28.—Woods, 239.—Wood-fuel, 331.—Wood, waxen, 170.—Workhouses, 349.

Y.

Yew-tree, leaves of, 287.

FINIS.

Printed by D. Walker, Glocester.